The determination of single sampling attribute plans with given producer's and consumer's risk.

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A table for solving the equation B(c,n,p) = P for c = 0(1)100 and 15 values of P.

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1. The problem.

Let n denote the sample size and c the acceptance number for a single sampling plan. The probability of acceptance, i.e. the probability of getting c or less defectives in the sample, considered as a function of the fraction defective, p, in the inspected lot (or process) is called the operating characteristic of the plan and is denoted by P(p). We shall consider operating characteristics computed from Poisson, binomial, and hypergeometric probability distributions.

It is common practice to specify an acceptable quality level, p_1, and a corresponding producer's risk, $\alpha = 1-P(p_1)$, an unsatisfactory quality level, $p_2 > p_1$, and a corresponding consumer's risk, $\beta = P(p_2)$, and then ask for the sampling plan (n,c) satisfying these requirements.

Since n and c have to be integers it is usually not possible to find a plan satisfying the requirements exactly. We therefore reformulate the problem in the following way:

Determine (n,c) so that $P(p_1) \geq 1-\alpha$, $P(p_2) \leq \beta$, and c is as small as possible, where $p_1 < p_2$ and $1-\alpha > \beta$.

This leads to a uniquely determined value of c and an interval for values of n, all satisfying the conditions. Further requirements are necessary to get n uniquely determined.

Most previous papers on this problem have provided tables and approximate solutions with special regard to the conventional values of α and β, viz. $\alpha = 5\%$ and $\beta = 10\%$. However, recent results in the theory of sampling inspection have led to discussions of systems of sampling plans where α and β are defined as decreasing functions of lot size. As examples we mention the following three systems which have been discussed by Hald (1965a, 1965b):

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A. A constant consumer's risk and a producer's risk inversely proportional to lot size (or a constant producer's risk and a consumer's risk inversely proportional to lot size).

B. A constant ratio of the two risks and one of them inversely proportional to lot size.

C. $P(p_0) = 1/2$, $p_1 < p_0 < p_2$, and one of the risks inversely proportional to lot size.

In such systems one will get rather small risks for large lots and therefore new approximations with known accuracy and new tables are required to find n and c.

The purpose of the paper is (1) to give a survey of exact and approximate solutions already known, (2) to discuss the exact solution for the binomial case by means of a new table, and (3) to present some new approximate solutions and discuss their accuracy.

2. The operating characteristic.

The probability of getting x defectives in a random sample of n items drawn without replacement from a lot of size N containing X defectives is

$$p\{x|N,X,n\} = \binom{X}{x}\binom{N-X}{n-x}\Big/\binom{N}{n} = \binom{n}{x}\binom{N-n}{X-x}\Big/\binom{N}{X}$$

where $N = 0,1,\ldots$, $0 \leq X \leq N$, $0 \leq n \leq N$, and $\max\{n-N+X,0\} \leq x \leq \min\{X,n\}$. The restriction on x may, however, be disregarded if, for integral values of a and b, we define $\binom{b}{a} = b!/a!(b-a)!$ for $0 \leq a \leq b$ and $\binom{b}{a} = 0$ otherwise.

The probability of acceptance for submitted lots of quality $X = Np'$, where $p' = 0,1/N,2/N,\ldots,1$, then becomes

$$P_H(p') = \Pr\{x \leq c|N,X,n\} = \sum_{x=0}^{c}\binom{n}{x}\binom{N-n}{X-x}\Big/\binom{N}{X} \quad . \tag{1}$$

This hypergeometric operating characteristic is defined for the $N+1$ values of p' only and decreases from 1 to 0 as p' increases from 0 to 1.

Let $f_N(X)$ denote the (prior) distribution of lot quality. This means that we consider p' and consequently also $P_H(p')$ as random variables so that we may compute the average probability of acceptance for all lots submitted for inspection

$$E\{P_H(p')\} = \sum_{X=0}^{N}\sum_{x=0}^{c} f_N(X)\binom{n}{x}\binom{N-n}{X-x}\Big/\binom{N}{X} \quad . \tag{2}$$

This gives a real number in $[0,1]$ depending on (N,n,c) and the parameters of $f_N(X)$.

The properties of the cumulative compound hypergeometric distribution (2) has been discussed by Hald (1960).

If the distribution of lot quality is binomial, i.e.

$$f_N(X) = \binom{N}{X} p^X q^{N-X} = b(X,N,p),$$

we get the joint distribution of (X,x) or of (x,y), where y = X-x denotes the number of defectives in the remainder of the lot, as

$$p(X,x|N,n,p) = b(x,n,p)b(X-x,N-n,p), \tag{3}$$

which means that x and y are stochastically independent and binomially distributed with the same parameter p.

It follows that

$$E\{P_H(p')\} = \sum_{x=0}^{c} b(x,n,p) = B(c,n,p), \tag{4}$$

i.e. the average probability of acceptance for lots produced under binomial control with process average equal to p may be found as the binomial probability B(c,n,p). It should be noted that the result does not depend on N.

The binomial probability B(c,n,p) occurs in discussions of operating characteristics with three different interpretations:

(1). It gives the exact probability of acceptance for lots of quality p = X/N if the sample items are drawn with replacement.

(2). It gives an approximation to the hypergeometric probability $P_H(p)$ if $n/N < 0.1$.

(3). It gives the average probability of acceptance as explained above and may therefore be considered as an (average) operating characteristic in relation to the process average.

Fig. 1 shows an example of the relation between $P_H(p')$, $f_N(X)$, and B(c,n,p).

In the theory of sampling inspection we nearly always consider the effect of using (or chosing) a sampling plan in relation to a series of lots of varying quality. If the quality variation is binomial nothing can be obtained by sampling inspection, apart from the screening of the sample. The problem is therefore only interesting if the quality variation is greater than binomial. The simplest family of prior distributions to use is the family of mixed binomial distributions defined by

$$f_N(X) = \int_0^1 b(X,N,p)dW(p),$$

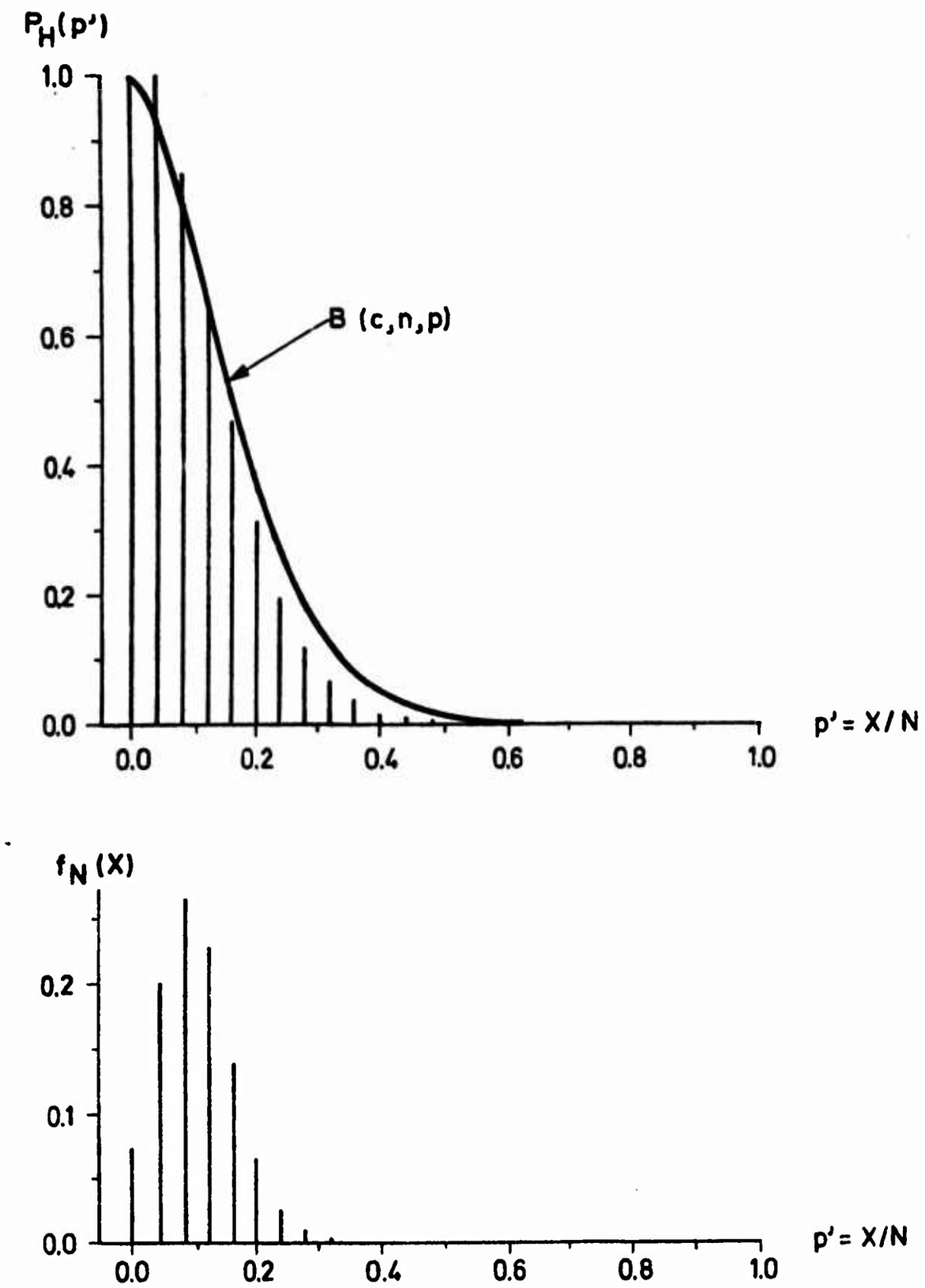

Fig. 1. Hypergeometric and binomial operating characteristics, and binomial prior distribution. N = 25, n = 10, c = 1, and E{X/N}=0.1. $E\{P_H(p')\} = B(c,n,0.1)$.

where W(p) denotes the cumulative distribution of p, see the discussion by Hald (1960). By means of (3) we find that the marginal distribution of x equals $f_n(x)$ and that

$$E_{p'}\{P_H(p')\} = \int_0^1 B(c,n,p)dW(p) = E_p\{B(c,n,p)\}, \tag{5}$$

where the expectations are with respect to lot quality and process average, respectively. We have thus proved that the average probability of acceptance for submitted lots with a mixed binomial quality distribution equals the average of the cumulative binomial with respect to the distribution of the process average. Because of this relationship, and the three interpretations of B(c,n,p) mentioned above, the binomial operating characteristic plays a fundamental role in the theory of sampling inspection.

For small values of p, $p < 0.1$ say, we may use the Poisson distribution

$$B(c,np) = \sum_{x=0}^{c} b(x,np) = \sum_{x=0}^{c} e^{-np}(np)^x/x!$$

as an approximation to B(c,n,p).

Some of the results given in the following regarding the Poisson solution may also be used directly in problems where the number of defects has a Poisson distribution with mean $m = np$.

A discussion of the accuracy of various approximations to B(c,n,p) has been given by Raff (1956).

3. The Poisson solution.

In sections 3 and 4 we shall assume that the operating characteristic is given by the cumulative Poisson distribution. Since

$$B(c,np) = Pr\{\chi^2 > 2np\}, \quad f = 2(c + 1), \tag{6}$$

where f denotes the degrees of freedom in the χ^2-distribution, the two inequalities for determining n and c may be written as

$$2np_1 \leq \chi^2_\alpha \quad \text{and} \quad 2np_2 \geq \chi^2_{1-\beta}, \quad f = 2(c + 1), \tag{7}$$

where χ^2_α denotes the α fractile of the χ^2-distribution.

Introducing the auxiliary function

$$r(c) = \chi^2_{1-\beta}/\chi^2_\alpha \quad , \quad f = 2(c + 1), \tag{8}$$

which is a decreasing function of c, and eliminating n from (7) we get the condition $p_2/p_1 \geq r(c)$.

The smallest value of c, $c = c_0$ say, satisfying (7) is therefore uniquely determined from the inequality

$$r(c_0-1) > p_2/p_1 \geq r(c_0). \tag{9}$$

Solving (7) with respect to n we find

$$\chi^2_{1-\beta} / 2p_2 \leq n \leq \chi^2_\alpha/2p_1, \quad f = 2(c_0+1). \tag{10}$$

For $c = c_0$ all integers satisfying (10) will give sampling plans satisfying the two basic inequalities.

This method of solution is due to Peach and Littauer (1946).

It follows from (9) that $\chi^2_\alpha/2p_1 \geq \chi^2_{1-\beta}/2p_2$ for $f = 2(c_0+1)$, and that a strict inequality is valid for $f > 2(c_0+1)$. Normally the interval defined by (10) will contain at least one integer. However, if this is not so c_0 must be replaced by c_0+1 and the corresponding n-interval, which contains the one based on c_0, may be found. This procedure is continued until an interval is found which contains at least one integer. With this modification (9) and (10) give the solution to the problem.

Table 1 shows the solution of the equations $B(c,np_1) = 0.95$ and $B(c,np_2) = 0.10$ as functions of c, and also the function r(c). Detailed tables have been given by Cameron (1952), Horsnell (1954), and Hald and Kousgaard (1966).

Table 1.

Table for determining (n,c) for $\alpha = 5\%$ and $\beta = 10\%$.

c	r(c)	np_1	np_2
0	44.89	0.05129	2.303
1	10.95	0.3554	3.890
2	6.51	0.8177	5.322
3	4.89	1.366	6.681
4	4.06	1.970	7.994
5	3.55	2.613	9.275
6	3.21	3.285	10.53
7	2.96	3.981	11.77
8	2.77	4.695	12.99
9	2.62	5.425	14.21
10	2.50	6.169	15.41
15	2.12	10.04	21.29
20	1.92	14.07	27.05
30	1.71	22.44	38.32

If the interval (10) contains more than one integer we have to introduce further requirements to get n uniquely determined.

From

$$\frac{\partial}{\partial n} B(c,np) = -pe^{-np}(np)^c/c!$$

it follows that $Q(p_1) = 1-B(c_0,np_1)$ is an increasing function of n and that $P(p_2) = B(c_0,np_2)$ is decreasing.

If for some reason it is particularly important that the consumer's risk is as near as possible to β then n should be chosen as the smallest integer satisfying (10). This choice will, however, lead to the largest deviation between α and the producer's risk. In such a case it is advisable to compute $Q(p_1)$ since the deviation may be rather large. An idea of this "error" may also be obtained by computing $p_1^* = p_2/r(c_0)$ since $Q(p_1^*) \cong \alpha$ whereas we aimed at $Q(p_1) \cong \alpha$. Analogous results are valid for the producer's risk.

We have thus proved that <u>the smallest sample size satisfying the two requirements is the one which makes the consumer's risk as nearly as possible equal to β</u>.

If there is no particular reason for preferring one of the relations n may for example be determined so that the weighted sum $Q(p_1)/\alpha + P(p_2)/\beta$ is minimized. Putting the derivative equal to zero we get

$$n = \left\{(c_0+1)\ln\frac{p_2}{p_1} - \ln\frac{\beta}{\alpha}\right\} / (p_2-p_1). \qquad (11)$$

One might also ask for the value of n minimizing $|P(p_2)/Q(p_1) - \beta/\alpha|$ which leads to the equation $P(p_2)/Q(p_1) = \beta/\alpha$. To get an approximate solution of this equation we write (10) as $n_2 \leq n \leq n_1$ which means that $B(c_0,n_2p_2) = \beta$ and $B(c_0,n_1p_1) = 1 - \alpha$. Expanding $\ln P(p_2)$ and $\ln Q(p_1)$ in Taylor series around n_2 and n_1, respectively, we find

$$\ln\frac{P(p_2)}{Q(p_1)} - \ln\frac{\beta}{\alpha} \cong (n_2 - n)p_2b(c_0,n_2p_2)/\beta + (n_1 - n)p_1b(c_0,n_1p_1)/\alpha = 0 \qquad (12)$$

so that n becomes a weighted average of n_1 and n_2.

<u>Example 1.</u> Let $p_1 = 0.01$, $p_2 = 0.06$, $\alpha = 5$ %, and $\beta = 10$ %. From Table 1 we get that $r(2) > 6 \geq r(3)$ so that $c_0 = 3$. From (10) and Table 1 we find $n \geq 6.681/0.06 = 111.4$ and $n \leq 1.366/0.01 = 136.6$ which means that all integral values of n in the interval [112, 136] satisfy the two requirements for $c = 3$.

For the larger value of n, $n = 136$, we find from a table of the Poisson distribution that $P(p_1) = 0.9505$ and $P(p_2) = 0.038$. From $r(3) = 4.89$ we get $p_2^* = p_1r(c_0) = 0.0489$ and $P(p_2^*) \cong 0.10$.

For the smaller value of n, n = 112, we find $P(p_2) = 0.098$ and $P(p_1) = 0.973$. From $p_1^* = p_2/r(c_0)$ we get $p_1^* = 0.0123$ and $P(p_1^*) \cong 0.95$.

From (11) we obtain the value of n minimizing $Q(p_1)/\alpha + P(p_2)/\beta$ as n = 129.

The value of n giving $P(p_2)/Q(p_1) = 2$ is 121.

Similar results have been derived for $\alpha = 0.5$ % and $\beta = 1$ %. A summary has been given in the following table.

Criterion for determination of n	$\alpha = 5\%$, $\beta = 10\%$, $c_0 = 3$ n	$100Q(p_1)$	$100P(p_2)$	$\alpha = 0.5\%$, $\beta = 1\%$, $c_0 = 8$ n	$100Q(p_1)$	$100P(p_2)$
$P(p_2) \cong \beta$	112	2.7	9.8	291	0.31	1.00
$P(p_2)/Q(p_1) \cong 2$	121	3.5	6.9	299	0.37	0.74
$\min\{Q(p_1)/\alpha + P(p_2)/\beta\}$	129	4.2	5.0	309	0.46	0.53
$Q(p_1) \cong \alpha$	136	5.0	3.8	313	0.50	0.46

4. Approximations to the Poisson solution.

We shall consider two approximations based on expansions of χ^2 and $z = \ln(\chi^2/f)$ according to the method given by Fisher and Cornish (1960).

The cumulants of z are

$$\kappa_1 = -\frac{1}{f} - \frac{1}{3f^2} + O\left(\frac{1}{f^3}\right), \qquad \kappa_2 = \frac{2}{f-1} + O\left(\frac{1}{f^3}\right),$$

$$\kappa_3 = -\frac{4}{(f-1)^2} + O\left(\frac{1}{f^4}\right), \qquad \kappa_4 = \frac{16}{(f-1)^3} + O\left(\frac{1}{f^4}\right),$$

see Bartlett and Kendall (1946).

Letting u denote the standardized normal variate the first three terms of the Fisher-Cornish expansion give

$$z = \kappa_1 + u\sqrt{\frac{2}{f-1}} - \frac{u^2-1}{6}\left(\frac{2}{f-1}\right) + O\left(\frac{1}{f^2}\right). \tag{13}$$

From (3) and (13) we find

$$\ln r(c) = z_{1-\beta} - z_\alpha = \frac{u_{1-\beta} - u_\alpha}{\sqrt{c+0.5}} - \frac{u_{1-\beta}^2 - u_\alpha^2}{6(c+0.5)} + O\left(\frac{1}{c^2}\right).$$

Solving this equation with respect to $\sqrt{c+0.5}$ we get approximately

$$\sqrt{c+0.5} \cong \frac{u_{1-\beta} - u_\alpha}{\ln r} - \frac{u_{1-\beta} + u_\alpha}{6}. \tag{14}$$

If α and β do not differ much the last term will be neglible. The inequality (9) is therefore approximately equivalent to the following simple rule:

<u>The acceptance number c_0 is equal to the smallest integer satisfying the inequality</u>

$$c \geq \left\{ \left(u_{1-\beta} - u_{\alpha} \right) \Big/ \left(\ln \frac{p_2}{p_1} \right) \right\}^2 - 0.5 \ . \qquad (15)$$

For small and different values of α and β (14) should be used instead of (15).

The following table shows two examples of the accuracy of (14) and (15). As values of r have been used the values corresponding to integral values of c, see Table 1, and c has been computed from (14) and (15) for comparison.

	α = 5%, β = 10%			α =0.5%, β= 1 %		
c	r(c)	(15)	(14)	r(c)	(15)	(14)
2	6.509	1.94	2.13	24.88	1.83	1.95
4	4.057	3.87	4.13	10.77	3.75	3.93
12	2.312	11.69	12.12	4.090	11.61	11.90
48	1.527	47.34	48.18	2.032	47.30	47.88

To find n we write (10) in the form

$$z_{1-\beta} - \ln \frac{c_0 + 1}{p_2} \leq \ln n \leq z_{\alpha} - \ln \frac{c_0 + 1}{p_1} \ ,$$

where z may be found from (13).

A more convenient formula for n may, however, be found from the Fisher-Cornish expansion of χ^2, viz.

$$\chi^2 = f + u\sqrt{2f} + \frac{2}{3}(u^2 - 1) + \frac{u^3 - 7u}{9\sqrt{2f}} + \underline{0}\left(\frac{1}{f}\right) .$$

The inequality $2np_1 \leq \chi^2_{\alpha}$, see (7), may therefore be written as

$$np_1 \leq c + 1 + u_{\alpha}\sqrt{c+1} + \frac{1}{3}\left(u_{\alpha}^2 - 1\right) + \frac{u_{\alpha}^3 - 7u_{\alpha}}{36\sqrt{c+1}} + \underline{0}\left(\frac{1}{c}\right) . \qquad (16)$$

The inequality giving the lower limit for n may be found by substituting p_2 and $1 - \beta$ for p_1 and α, respectively.

Table 2 gives an impression of the accuracy of (16) for $\alpha = 0.05$ and $\beta = 0.10$. A general evaluation of the accuracy will be given in section 6 in connection with a discussion of the corresponding formula for the binomial distribution.

The value of c_0 found from (15) may occasionally be one unit too small. Such errors will, however, be disclosed by computing the interval for n, since the upper limit for n computed from (16) in such cases will be smaller than the correspondingly computed lower limit.

Table 2.

Comparisons of exact and approximative values of m = np found from $m = \chi^2/2$ and from (16), respectively, for $\alpha = 0.05$ and $\beta = 0.10$.

	$\alpha = 0.05$		$\beta = 0.10$	
c	Approx.	Exact	Approx.	Exact
0	0.12	0.05	2.31	2.30
1	0.38	0.36	3.89	3.89
2	0.83	0.82	5.33	5.32
3	1.38	1.37	6.68	6.68
4	1.98	1.97	8.00	7.99
5	2.62	2.61	9.28	9.27
10	6.17	6.17	15.41	15.41
20	14.07	14.07	27.05	27.05
30	22.45	22.44	38.32	38.32

Example 2. Using the approximations for solving the problem in Example 1 we first find from (15) that $c \geq 2.2$, i.e. $c_0 = 3$. Next (16) and the analogous formula for np_2 lead to $112 \leq n \leq 137$.

For $\alpha = 0.5\%$ and $\beta = 1\%$ we find from (15) that $c \geq 6.98$, i.e. $c_0 = 7$ instead of the correct value 8. However, (16) gives $n \leq 260$ and $n \geq 273$ which discloses that c_0 must be larger than 7. For $c_0 = 8$ we find $296 \leq n \leq 316$.

5. The binomial solution.

Analogously to (6) we may use the relation between the cumulative binomial and the F-distribution

$$B(c,n,p) = \Pr\left\{F > \frac{f_2 p}{f_1 q}\right\}, \quad f_1 = 2(c+1), \quad f_2 = 2(n-c), \tag{17}$$

so that the two inequalities for determining n and c become

$$\frac{f_2 p_1}{f_1 q_1} \leq F_\alpha(f_1,f_2) \text{ and } \frac{f_2 p_2}{f_1 q_2} \geq F_{1-\beta}(f_1,f_2). \tag{18}$$

Solving with respect to p_1 and p_2 we get

$$p_1 \leq \frac{f_1 F_\alpha}{f_2 + f_1 F_\alpha} \quad \text{and} \quad p_2 \geq \frac{f_1 F_{1-\beta}}{f_2 + f_1 F_{1-\beta}}. \tag{19}$$

It is, however, not possible to eliminate n and solve for c as in the Poisson case because F depends on n as well as c. The inequalities must therefore be

solved by trial and error.

The above method of solution is due to Peach and Littauer (1946). To facilitate the solution for $\alpha = 0.05$ and $\beta = 0.10$ Grubbs (1949) has tabulated the right hand side of (19) for c = 0(1)9 and n = 1(1)150.

A new table by Hald and Kousgaard (1966) giving the solution of the equation $B(c,n,p) = P$ for 15 values of P between 0.001 and 0.999 and c = 0(1)100 facilitates the determination of (n,c) and the computation of the operating characteristic. The table contains n (considered as a continuous variable) to 4 significant figures as a function of c for given values of p, and these values have been chosen in such a manner that linear interpolation on np with respect to p gives very accurate results. An example will be given below.

The general remarks in section 3 about the properties of the solution are also valid here. For the smallest value of c, c_0 say, satisfying the two inequalities we get an interval $n_2 \leqq n \leqq n_1$ so that

$$B(c_0,n_1,p_1) \geqq 1-\alpha > B(c_0,n_1+1,p_1) \text{ and } B(c_0,n_2,p_2) \leqq \beta \quad B(c_0,n_2-1,p_2).$$

From $\Delta_n B(c,n,p) = -pb(c,n,p)$ we find that the value of n minimizing $Q(p_1)/\alpha + P(p_2)/\beta$ equals the smallest integer satisfying

$$n \geqq \left\{(c_0+1)\ln\frac{p_2q_1}{p_1q_2} - \ln\frac{\beta}{\alpha}\right\} \Big/ \left(\ln\frac{q_1}{q_2}\right) \quad -1. \tag{20}$$

Similarly we find an approximation to the solution of the equation $P(p_2)/Q(p_1)=\beta/\alpha$ by solving the linear equation

$$(n_2-n)p_2b(c_0,n_2,p_2)/\beta + (n_1-n)p_1b(c_0,n_1,p_1)/\alpha = 0. \tag{21}$$

Example 3.

From the table by Hald and Kousgaard (1966) we get for $p_1 = 0.01$ and $p_2 = 0.06$ the results shown in the table below.

	$B(c,n,p_1) = 0.95$	$B(c,n,p_2) = 0.10$
c	n	n
2	82.36	87.03
3	137.4	109.5
4	198.0	131.2

It follows immediately that the smallest value of c satisfying the inequalities

$B(c,n,p_1) \geq 0.95$ and $B(c,n,p_2) \leq 0.10$ is $c_0 = 3$, and that the corresponding n-interval is [110, 137].

From (20) we get $n = 128$ as the value minimizing $Q(p_1)/\alpha + P(p_2)/\beta$, and from (21) we find $n = 120$ as the value satisfying the equation $P(p_2)/Q(p_1) \cong 2$.

Because of the rather small values of p_1 and p_2 the values of n found from the binomial probabilities deviate at most 2 from the values determined from Poisson probabilities in Example 1.

6. Approximations to the binomial solution.

From $F = \chi_1^2 f_2 / \chi_2^2 f_1$ we get $\ln F = z_1 - z_2$ where z_1 and z_2 are stochastically independent. We may therefore find the cumulants of ln F from those of z given in section 4.

As a first approximation to the fractiles of ln F we may use the expansion

$$\ln F = \mu + u\sigma + \underline{O}(1/f) \tag{22}$$

where $\mu = E(\ln F)$ and

$$\sigma^2 = \frac{2}{f_1 - 1} + \frac{2}{f_2 - 1} .$$

From (18) we have

$$\frac{p_2 q_1}{p_1 q_2} \geq \frac{F_{1-\beta}(f_1,f_2)}{F_\alpha(f_1,f_2)}$$

and using (22) we find

$$\ln \frac{p_2 q_1}{p_1 q_2} \geq (u_{1-\beta} - u_\alpha) \sqrt{\frac{2}{f_1 - 1} + \frac{2}{f_2 - 1}}$$

or

$$\sqrt{c + 0.5}\, \ln \frac{p_2 q_1}{p_1 q_2} \geq (u_{1-\beta} - u_\alpha) \sqrt{1 + \frac{c+0.5}{n-c-0.5}} . \tag{23}$$

To compare this result with (15) we introduce the auxiliary quantity c^* defined by

$$\sqrt{c^* + 0.5} = (u_{1-\beta} - u_\alpha) / \left(\ln \frac{p_2}{p_1} \right) \tag{24}$$

which leads to

$$c + 0.5 \geq (c^* + 0.5) \left(\frac{\ln(p_2/p_1)}{\ln(p_2 q_1 / p_1 q_2)} \right)^2 \left(1 + \frac{c+0.5}{n-c-0.5} \right). \tag{25}$$

An approximation to the last factor may be found by using n and c from the Poisson solution or, if α and β are not very different, by replacing $(c+0.5)/(n-c-0.5)$ by $(p_1+p_2)/2$. Table 3 shows some values of the factor ρ to $(c^*+0.5)$ obtained by using the last-mentioned approximation. Thus, the binomial acceptance number may be determined approximately as the smallest integer satisfying the inequality $c + 0.5 \geq (c^* + 0.5)\rho$.

Since c^* is an approximation to the acceptance number for the Poisson distribution it follows from Table 3 that the acceptance number in the binomial case normally will be at most 10% smaller than the acceptance number in the Poisson case.

Table 3.

Table of $\rho = \left(\frac{\log(p_2/p_1)}{\log(p_2q_1/p_1q_2)}\right)^2\left(1 + \frac{p_1+p_2}{2}\right)$

as a function of p_1 and $r = p_2/p_1$.

$100p_1$	1.5	2	3	4	5	7	10
0.1	0.999	0.999	0.998	0.998	0.998	0.998	0.998
0.5	0.994	0.993	0.992	0.991	0.990	0.989	0.987
1.0	0.988	0.986	0.983	0.981	0.979	0.976	0.973
2.0	0.975	0.971	0.965	0.960	0.956	0.948	0.937
3.0	0.962	0.956	0.947	0.939	0.931	0.916	0.894
4.0	0.949	0.941	0.927	0.915	0.904	0.880	0.841
5.0	0.935	0.925	0.907	0.891	0.874	0.840	0.780
7.0	0.908	0.892	0.864	0.837	0.810	0.747	0.623
10.0	0.864	0.840	0.795	0.748	0.697	0.572	-

Table 4 contains some typical examples of the accuracy of the approximate formulas for determining c. The deviation between the approximate and the exact values is at most 1.

Table 4.

Examples of the determination of c from exact and approximate formulas.

		α = 5% and β = 10%					α = 0.5% and β = 1%				
p_1	p_2	c^*	Poisson Approx.	Poisson Exact	Binomial Approx.	Binomial Exact	c^*	Poisson Approx.	Poisson Exact	Binomial Approx.	Binomial Exact
0.01	0.02	17.3	18	18	18	18	49.5	50	51	49	50
	0.05	2.8	3	3	3	3	8.8	9	10	9	9
	0.10	1.1	2	2	2	2	4.0	5	5	4	5
	0.15	0.7	1	1	1	1	2.8	3	3	3	3
	0.20	0.5	1	1	1	1	2.2	3	3	3	3
0.02	0.05	9.7	10	10	10	10	28.1	29	29	28	28
	0.10	2.8	3	3	3	3	8.8	9	10	9	9
	0.15	1.6	2	2	2	2	5.4	6	6	6	6
	0.20	1.1	2	2	2	1	4.0	5	5	4	4
0.05	0.10	17.3	18	18	17	17	49.5	50	51	46	47
	0.15	6.6	7	7	6	7	19.4	20	20	18	19
	0.20	4.0	4	5	4	4	12.0	13	13	11	12
0.10	0.15	51.6	52	53	45	46	145.7	146	147	126	.
	0.20	17.3	18	18	15	16	49.5	50	51	42	43

The Poisson approximation is found from $c \geq c^*$, see (15) and (24). The binomial approximation is found from $c + 0.5 \geq \rho(c^* + 0.5)$, see (25) and Table 3.

Using the relation between the binomial and the beta distribution, $B(c,n,p) = 1-I_p(c+1, n-c)$, we shall derive an expansion corresponding to (15). From $B(c,n,p) = 1-\alpha$ it follows that p may be considered as the α fractile in the beta distribution with parameters $\nu_1 = c+1$ and $\nu_2 = n-c$. Writing $\nu = \nu_1 + \nu_2$ the Fisher-Cornish expansion gives

$$p = \frac{\nu_1}{\nu} + \left(\frac{\nu_1\nu_2}{\nu+1}\right)^{1/2} \frac{u}{\nu} + \frac{(\nu_2-\nu_1)(u^2-1)}{3\nu(\nu+2)}$$

$$+ \frac{[\nu_1(\nu_1+1)(\nu_1-2\nu_2)+ \nu_2(\nu_2+1)(\nu_2-2\nu_1)][u^3-3u]}{4[\nu_1\nu_2(\nu+1)]^{1/2}\ \nu(\nu+2)(\nu+3)}$$

$$- \frac{(\nu_2-\nu_1)^2\ (\nu+1)^{1/2}\ (2u^3-5u)}{9(\nu_1\nu_2)^{1/2}\ \nu(\nu+2)^2} + \underline{O}(\nu^{-2}),$$

where $u = u_\alpha$. For $n \to \infty$ and $c \to \infty$ we may "solve" for c and n which leads to

$$c = np - u\sqrt{npq} - \frac{1}{2} + \frac{1}{6}(u^2-1)(q-p) + \{u^3(1+2pq) + u(2-14pq)\}/72\sqrt{npq} + \underline{O}(n^{-1}) \qquad (26)$$

and

$$np = c + 1 + u\sqrt{q(c+1)} - \frac{1}{3}(1+p) + \frac{1}{6}u^2(1+q) + \{u^3(2q-p^2) - u(14q+2p^2)\}/72\sqrt{q(c+1)} + \underline{O}(c^{-1}). \qquad (27)$$

This result is analogous to (15) and may be used in the same manner to determine the interval for n corresponding to a given c.

It is important to use (c+1) as variable in the expansion for n since this gives a considerably better approximation for small c than an expansion in terms of c.

An investigation of the accuracy of (27) has been carried out by comparing the values of n computed from this formula for p = 0.001, 0.01, 0.05, 0.10, 0.25 and 0.50 with the exact values given in the table by Hald and Kousgaard (1953) considering n as a continuous variable. Table 5 shows the absolute value of the maximum relative error in per cent for selected values of B(c,n,p) and c, the maximum being taken with respect to p, i.e. for $p \leq 0.5$. The maximum relative error has in most cases been found for p = 0.001, and the relative error is normally a slightly decreasing function of p for $0 \leq p \leq 0.5$. Since (27) reduces to (15) for $p \to 0$ the table also gives the maximum relative error of n found from (15).

It will be seen that the maximum relative error generally increases with the value of B(c,n,p) and decreases rapidly with c. For $B(c,n,p) \leq 0.95$ the error is less than 1% for c = 3 and less than 0.1% for c = 10.

Table 5.

Absolute value of the maximum relative error of n in per cent by using (16) or (27) for $p \leq 0.5$.

	B(c,n,p)										
c	0.001	0.01	0.05	0.1	0.2	0.5	0.8	0.9	0.95	0.99	0.999
0	3.6	1.9	0.7	0.1	0.8	4.0	22.5	-	-	-	-
1	1.5	0.7	0.3	0.1	0.3	0.7	1.0	3.1	7.2	70.0	-
2	0.8	0.4	0.1	0.1	0.2	0.3	0.3	0.6	1.9	14.8	94.3
3	0.6	0.3	0.1	0.1	0.2	0.2	0.2	0.2	0.8	5.6	30.6
5	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.3	7.5
10	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.2
20	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
100	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0

In case of no entry the maximum relative error is larger than 100%.

The advantage of the approximations given above is that they only require a table of the fractiles of the normal distribution. If, however, the exact Poisson solution is readily available we can use another approximation to n which may be derived from a formula by Wise (1954). Consider the Poisson equation $B(c,m) = P$ and the binomial equation $B(c,n,p) = P$ with the same c. It then follows that $n - c/2 \cong m/p - m/2$ or

$$n \cong \frac{m}{p} - \frac{m-c}{2} . \qquad (28)$$

This result has previously been discussed by Hald (1952) for $P = 0.10$.

The relative error of n found from (28) is in general a decreasing function of c (disregarding $c = 0$) and increasing with p and the value of $B(c,n,p)$. For $p \leq 0.2$ and $B(c,n,p) \leq 0.5$ the relative error of n will be less than 0.5% for all c. For $B(c,n,p) = 0.95$ and $p = 0.2$ the maximum relative error is 3.6%, which is obtained for $c = 1$, and for $c \geq 5$ the relative error is less than 1%.

For small values of p we naturally find that (28) gives more accurate results than (27) whereas the opposite is true for large values of p. A comparison has been carried out for $p = 0.2$ and selected values of $B(c,n,p)$ with the result that (28) is the more accurate only for $c \leq 1$ and $0.05 \leq B \leq 0.95$, and for $c \leq 3$ for $B = 0.001$ and $B = 0.999$.

Example 4. Using the approximations to solve the problem in Example 3 we first find $c^* = 2.2$ from (24). From Table 3 we get for $p_1 = 0.01$ and $r = 6$ that $p = 0.978$ so that the acceptance number is determined as the smallest integer satisfying the inequality $c + 0.5 \geq 0.978\,(c^* + 0.5) = 2.6$, i.e. $c_0 = 3$. From (27) we find the corresponding n-interval as $[110,138]$ and (28) gives $[110,137]$ as compared to the correct result $[110,137]$.

7. The hypergeometric solution.

For small values of N the exact solution may in some cases be obtained from existing graphs and tables, see Wiesen (1958), Clark and Koopmans (1959), and Lieberman and Owen (1961). In general, however, it is necessary to start from an approximate solution which may then be improved by iteration or by trial and error.

We shall here discuss the applications of two binomial approximations. Let the hypergeometric operating characteristic (1) be denoted by $H(c,n,p',N)$. It has been shown by Wise (1954) that

$$H(c,n,p',N) \cong B(c,n,p) \tag{29}$$

where

$$p = \frac{Np' - c/2}{N-(n-1)/2} = p' + \frac{(n-1)p'-c}{2N-n+1} \quad . \tag{30}$$

We may therefore use an iterative procedure starting from $B(c,n,p_1') \geq 1 - \alpha$ and $B(c,n,p_2') \leq \beta$, say, to determine a first approximation to (n,c), use these values to determine (p_1,p_2) from (30), solve for (n,c) with the new values of p, etc.

Since in most cases, apart from $c = 0$, $np_1' < c < np_2'$ it follows from (30) that $p_1 < p_1' < p_2' < p_2$ so that the binomial c determined from (p_1',p_2') will be an upper bound for the hypergeometric c.

The approximation (29) is not as accurate as

$$H(c,n,p',N) \cong B(c,\nu,p^*) \tag{31}$$

where

$$\nu = np' \Big/ \left(1 - q' \frac{N-n}{N-1}\right) \text{ and } p^* = np'/\nu, \tag{32}$$

which is due to Sandiford (1960). This formula is not useful for computing (n,c), but it may be used to check (and correct) the values obtained by the method indicated above.

For $p' < 0.10$ it is mostly sufficiently accurate to use the approximation

$$H(c,n,p',N) \cong B(c,Np', n/N). \tag{33}$$

Using the binomial c (determined from $B(c,n,p_1')$ and $B(c,n,p_2')$) we may compute the interval for n from (33). If it does not contain an integer, c is too small, and if the interval is large c may possibly be chosen smaller. These computations may easily be carried out by means of the tables by Hald and Kousgaard (1966).

Example 5. The following example has been selected to show a case with different acceptance numbers for the Poisson, the binomial, and the hypergeometric distribution. Let the lot size be N = 100, and let $p_1 = 0.05$, $\alpha = 0.05$, and $p_2 = 0.20$, $\beta = 0.10$. The exact solutions are as follows

	c	n
Hypergeometric	3	29 - 35
Binomial	4	38 - 40
Poisson	5	47 - 52

To demonstrate the use of (29) and (30) we start from $p_1' = 0.05$ and $p_2' = 0.20$ and derive the binomial solution given above, for example from the tables by Hald and Kousgaard (1966). Setting c = 4 and n = 39 in (30) we get $p_1 = 0.0370$ and $p_2 = 0.222$ which lead to c = 3 and $29 \leq n \leq 37$. For c = 3 and n = 33 we get $p_1 = 0.0417$ and $p_2 = 0.220$ which lead to c = 3 and $29 \leq n \leq 33$. The third iteration gives c = 3 and $30 \leq n \leq 34$.

To check the solution by means of (31) and (32) we find from n = 30 and p' = 0.20 that $\nu = 13.81$ and $p^* = 0.434$. From the table by Hald and Kousgaard (1966) we get the solution to the equation $B(3,\mu,0.434) = 0.10$ as $\mu = 13.36$. Since $\nu > \mu$ we conclude that $B(c,\nu,p^*) < 0.10$, and consequently that also the hypergeometric probability is less that 0.10. We therefore try n = 29 and p' = 0.20 which lead to $\nu = 13.61$ and $p^* = 0.426$. Solving $B(3,\mu,0.426) = 0.10$ we get $\mu = 13.62$ Since $\nu < \mu$ we conclude that $B(c,\nu,p^*) > 0.10$, and that also the hypergeometric probability is larger than 0.10 so that n = 29 should not be included in the interval for n. This conclusion is actually wrong since the hypergeometric probability equals 0.09926, i.e. it is very near to but smaller than 0.10. The small difference of ν and μ also indicates that we have a borderline case which has to be evaluated exactly to get the right conclusion.

From n = 34 and p' = 0.05 we find $\nu = 4.636$, $p^* = 0.367$, and $B(3,\mu,0.367) = 0.95$ which gives $\mu = 4.75$ so that $B(c,\nu,p^*) > 0.95$. Also for n = 35 we get $\nu < \mu$ but for n = 36 we obtain $\nu = 4.664$, $p^* = 0.386$, and $\mu = 4.58$ so that $B(c,\nu,p^*) < 0.95$.

Application of (31) and (32) thus leads to the conclusion that $30 \leq n \leq 35$.

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References.

Bartlett, M.S. and Kendall, D.G. (1946). The statistical analysis of variance-heterogeneity and the logarithmic transformation. Suppl. J.R.Statist. Soc., 8, 128-138.

Cameron, J.M. (1952). Tables for constructing and for computing the operating characteristics of single-sampling plans. Indust.Qual.Contr., 9, No. 1, 37-39.

Clark, C.R. and Koopmans, L.H. (1959). Graphs of the hypergeometric OC and AOQ functions for lot sizes 10 to 225. Sandia Corp.Monograph, SCR 121.

Fisher, R.A. and Cornish, E.A. (1960). The percentile points of distributions having known cumulants. Technometrics, 2, 209-225.

Grubbs, F.E. (1949). On designing single sampling inspection plans. Ann. Math. Statist., 20, 242-256.

Hald, A. (1960). The compound hypergeometric distribution and a system of single sampling inspection plans based on prior distributions and costs. Technometrics, 2, 275-340.

Hald, A. (1965a). Bayesian single sampling attribute plans for discrete prior distributions. Mat.Fys.Skr.Dan.Vid.Selsk., 3, No. 2, Munksgaard, Copenhagen.

Hald, A. (1965b). On the theory of single sampling inspection by attributes based on two quality levels. Duplicated report. To be published in Rev.Int.Statist. Inst., 35.

Hald, A. and Kousgaard E. (1966). A table for solving the equation B(c,n,p) = P for c = 0(1)100. Duplicated report.

Horsnell, G. (1954). The determination of single-sample schemes for percentage defectives. Appl.Statist., 3, 150-158.

Lieberman, G.J. and Owen, D.B. (1961). Tables of the hypergeometric probability distribution. Stanford Univ. Press.

Peach, P. and Littauer, S.B. (1946). A note on sampling inspection. Ann. Math. Statist., 17, 81-84.

Raff, M.S. (1956). On approximating the point binomial. J.Amer. Statist. Ass., 51, 293-303.

Sandiford, P.J. (1960). A new binomial approximation for use in sampling from finite populations. J.Amer.Statist.Ass., 55, 718-722.

Wiesen, J.M. (1958). Extension of existing tables of attribute sampling plans. Sandia Tech. Memo., 42-58(12).

Wise, M.E. (1954). A quickly convergent expansion for cumulative hypergeometric probabilities, direct and inverse. Biometrika, 41, 317-329.

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A table for solving the equation B(c,n,p) = P for c = 0(1)100 and 15 values of P.

By

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1. Introduction and summary.

The table contains values of n to four significant figures satisfying the equation

$$B(c,n,p) = \sum_{x=0}^{c} \binom{n}{x} p^x (1-p)^{n-x} = P \qquad (1)$$

for c = 0(1)100, 14 values of p ranging from 0.001 to 0.5, and 15 values of P from 0.001 to 0.999. The variable n has been treated as a continuous variable by defining $\binom{n}{x}$ as $n(n-1)\ldots(n-x+1)/x!$ for any real value of $n \geq x$.

Since $B(c,n,p) = 1 - B(n-c-1, n, 1-p)$ the table may also be used for $0.5 < p < 1$ and integral values of $n-c \leq 101$.

From the relationship

$$B(c,n,p) = 1 - I_p(c+1, n-c) = I_{1-p}(n-c, c+1),$$

where $I_x(a,b)$ denotes the cumulative beta distribution with parameters (a,b), it follows that the table also may be used to find fractiles of the beta distribution.

The table has been constructed with the main purpose to provide a simple and comprehensive means for computing the binomial operating characteristic of single sampling plans or equivalently to find confidence limits for p in the binomial distribution. Since acceptance numbers for sampling plans and number of failures in reliability investigations usually are less than 100 the table has been limited to c = 0(1)100.

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Other tables constructed for similar purposes - including tables of fractiles of the beta distribution - give p directly as function of c and n (or n - c) for given P with a rather limited range of variation for (c,n) or with a spacing of (c,n) requiring interpolation with respect to both arguments apart from small values of both c and n.

The idea of the present table is to give n as function of p, $n = n(p)$, for given c and P with such a spacing of p that the function $pn(p)$ is practically linear between the given arguments. This leads to very simple formulas of interpolation for both p and n with a maximum relative error of 0.1 % in most cases.

Since $\Delta_n B(c,n,p) = -pb(c,n,p) < 0$ it follows that n(p) is a decreasing function of p so that the values of n tabulated are larger than or equal to n(0.5).

An essential advantage of the table as compared to the tables mentioned above is that for $c \leq 100$ and $n \geq n(0.5)$ interpolation is required only with respect to n for determining p.

The table has been calculated on a GIER-computer with an error on the fifth significant figure of n less than 1. The rounding off to four significant figures has been carried out so that the table gives for $P < 0.5$ the smallest n for which $B(c,n,p) \leq P$, for $P > 0.5$ the largest n for which $B(c,n,p) \geq P$, and for $P = 0.5$ the value of n which minimizes $|B(c,n,p) - 0.5|$.

Even if the main purpose of the table has been to facilitate the determination of p for given values of the other parameters, the table may naturally be used to determine any one of the four parameters for given values of the three others.

A special table with smaller intervals for p has been given for c = 1,2, and 3 to obtain sufficient accurate interpolates.

The binomial table has been supplemented by a corresponding Poisson table giving np as function of c for given P by solving the equation

$$B(c,np) = \sum_{x=0}^{c} e^{-np}(np)^x/x! = P. \qquad (2)$$

This value of np naturally equals $\lim [pn(p)]$ for $p \to 0$.

The values of np for $P = 0.5$ have not been included because the formula $np = c + 2/3$ is correct to four significant figures for $c \geq 10$, and the first 10 values of np are: 0.6931, 1.678, 2.674, 3.672, 4.671, 5.670, 6.670, 7.669, 8.669, 9.669.

As examples of use of the table we shall discuss some problems from the theory of sampling inspection:

(1) To find the acceptance number corresponding to given sample size, quality level and acceptance probability (Example 9).

(2) To find the sample size corresponding to given acceptance number, quality level and acceptance probability (Example 3).

(3) To find a sampling plan with given producer's and consumer's risk (Example 11).

(4) To find the operating characteristic for a given sampling plan (Example 5 and 6).

(5) To find a system of IQL plans with a producer's risk decreasing with lot size (Example 12).

Furthermore, examples are given on the computation of significance and confidence limits for the binomial distribution (Example 7 and 10), and the Pascal distribution (Example 4 and 8) which may be used for example in reliability theory.

For a reader familar with such problems it is necessary to read only the following section on interpolation to be able to use the table effectively.

2. Interpolation and asymptotic formulas.

Interpolation for n or p.

For given c and P the product pn(p) is nearly a linear function of p between the given arguments. For arguments (p_1,p_2) and corresponding values (n_1,n_2) we therefore have with good approximation for $p_1 < p < p_2$ that

$$np = [n_1p_1(p_2-p) + n_2p_2(p-p_1)] / (p_2-p_1),$$

which leads to

$$p = [(n_1-n_2)p_1p_2] / [(n_1-n)p_1 + (n-n_2)p_2], \quad n_1 > n > n_2, \quad (3)$$

and

$$n = [n_1p_1(p_2-p) + n_2p_2(p-p_1)] / [(p_2-p_1)p], \quad p_1 < p < p_2. \quad (4)$$

If less accuracy is required pn(p) may be considered to be nearly constant in the neighbourhood of the nearest tabulated value of p or n, i.e. $p = n_1p_1/n$ and $n = n_1p_1/p$.

An investigation of the accuracy of these formulas has been carried out by comparing interpolates with exact values for values of p equal to the midpoints of the

intervals used in the main table. The result has been summarized in the following tables.

Maximum absolute error on fourth significant figure and maximum relative error in per cent by calculating p from formula (3),

c \ P	Max. error on 4th sign. figure					Max. relative error in per cent		
	0.999	0.99	0.95	0.80	≦ 0.50	0.999	0.99	≦ 0.95
0	3	3	3	5	3	0.1	0.1	0.1
1-3	60	16	7	3	3	1.3	0.3	0.1
4-9	20	3	3	3	3	0.5	0.1	0.1
10-19	10	3	3	3	3	0.1	0.1	0.1
20-100	3	3	3	3	3	0.1	0.1	0.1

Maximum absolute error on fourth significant figure and maximum relative error in per cent by calculating n from formula (4).

c \ P	Max. error on 4th sign. figure					Max. relative error in per cent		
	0.999	0.99	0.95	0.80	≦ 0.50	0.999	0.99	≦ 0.95
0	2	2	2	1	1	0.1	0.1	0.1
1-3	15	6	3	3	1	0.8	0.2	0.1
4-9	8	4	3	3	1	0.1	0.1	0.1
10-100	4	4	3	3	1	0.1	0.1	0.1

Maximum relative error in per cent by calculating n or p from $np = n_1 p_1$.

c \ P	0.999	0.99	≦ 0.95
0	2.0	2.0	2.0
1-3	16.0	8.0	3.0
4-9	5.0	3.0	2.0
10-39	3.0	2.0	1.0
40-100	1.0	1.0	0.5

It will be seen that the error may become particularly large for c = 1,2, and 3. Therefore for these three values of c the main table has been supplemented by a special table in which the p-intervals have been halved.

Generally the maximum relative error on p or n determined from (3) and (4) will be less than 0.1 per cent which suffices for most applications. In most cases the actual error is considerably less than 0.1 per cent.

Example 1. Interpolation for p and n.

Let us determine the solution to the equation B(4, 150, p) = 0.10. Since the table gives $n_1 = 157.9$ for $p_1 = 0.05$ and n_1 is close to n the simple formula 100 p = 5 x 157.9/150 = 5.263 gives a rather accurate result. Formula (3) leads to

$$100p = (157.9 - 112.2)35/[(157.9 - 150.0)5 + (150.0 - 112.2)7] = 5.260.$$

Next, let us determine n so that B(5,n,0.08) = 0.10. The simple formula gives n = 130.4 x 7/8 = 114.1, and formula (4) leads to

$$n = [9.128 \times 2 + 9.057 \times 1] \,/\, [0.08 \times 3] = 113.8.$$

Interpolation for P.

The problem is to determine B(c,n,p) for given c, n and p. Denoting the unknown value by P it is usually easy by inspection of the table to find two consecutive tabular values, P_1 and P_2 say, so that

$$P_1 = B(c,n_1,p) < B(c,n,p) \leqslant B(c,n_2,p) = P_2,$$

where $n_1 > n > n_2$. If p does not equal one of the given arguments, n_1 and n_2 have to be determined by (4). Finally, a first approximation to P is found by linear interpolation with respect to n.

Outside the interval $0.10 < P < 0.90$ linear interpolation will hardly be sufficiently accurate. One may therefore use three values (P_1,P_2,P_3) and find P by quadratic interpolation with respect to n using for example Aitken's iterative linear interpolation or equivalently

$$P = \frac{(n_1-n)(n_2-n)(n_3-n)}{(n_1-n_2)(n_1-n_3)(n_2-n_3)} \left[\frac{n_2-n_3}{n_1-n} P_1 + \frac{n_1-n_3}{n-n_2} P_2 + \frac{n_1-n_2}{n_3-n} P_3 \right]. \qquad (5)$$

It is easier to carry out the computations by three linear interpolations as shown in Example 2 than to use (5).

Instead of keeping p fixed and determining (n_1,n_2) as above one might have kept n fixed and found (p_1,p_2) by (3) and finally P by interpolation with respect to p. However, since (4) is a little easier to use than (3) the first procedure is preferable.

Other possibilities are to interpolate on log P for small values of P (and on log (1-P) for large P) or on the corresponding normal deviate.

Example 2. Interpolation for P.

To determine $P = B(4, 116, 0.012)$ we see from the table that $0.975 < P < 0.99$. From (4) we find $n_1 = 136.5$ and $n_2 = 107.9$ as the two values satisfying $B(4,n_1,0.012) = 0.975$ and $B(4,n_2,0.012) = 0.99$. Linear interpolation with respect to n gives $P_{12} = 0.98575$.

To improve this result we find $n_3 = 91.26$ from the equation $B(4,n_3,0.012) = 0.995$. Linear "interpolation" based on n_2 and n_3 gives $P_{23} = 0.98757$.

Finally linear interpolation between P_{12} and P_{23} using n_1 and n_3 as arguments leads to

$$P = 0.98575 + 0.00182 \times 20.5/45.24 = 0.98657.$$

This result could also have been found directly from (5). The exact value is $P = 0.98667$.

To show the corresponding calculations with n fixed we first determine $p_1 = 0.01414$ and $p_2 = 0.01115$ as the two values satisfying $B(4,116,p_1) = 0.975$ and $B(4,116,p_2) = .0199$, see (3). Linear interpolation with respect to p gives $P_{12} = 0.98574$.

To improve this result we find $p_3 = 0.009406$ from the equation $B(4,116,p_3) = 0.995$. Linear "interpolation" based on p_2 and p_3 gives $P_{23} = 0.98756$. Finally, linear interpolation between P_{12} and P_{23} leads to $P = 0.98656$ as compared to 0.98657 found above.

More examples of the accuracy of linear and quadratic interpolation may be found in Example 12.

Asymptotic formulas.

Using the relationship between the binomial and the beta distribution combined with the Fisher-Cornish expansion for the fractiles of the beta distribution we find the following expansion of n in terms of c, p and P.

$$np = c+1+u\sqrt{q(c+1)} - (1+p)/3 + u^2(1+q)/6 + [u^3(2q-p^2) - u(14q + 2p^2)] / 72\sqrt{q(c+1)} + O(c^{-1}), \qquad (6)$$

where u denotes the (1-P) fractile of the standardized normal distribution. A more detailed discussion of this approximation to n has been given by Hald (1966).

Setting $p = 0$ on the right hand side of (6) we get an approximation to the solution of (2).

The relative error by using (6) is less than 0.1 % for $0.001 \leq P \leq 0.999$ and $c \geq 20$.

3. Examples of determination of n.

For given values of c, p and P (P being one of the tabular values) we may find n from (4).

Example 3. The sample size corresponding to a given acceptance number, quality level and acceptance probability.

For the acceptance number c = 5, say, we want to determine the sample size so that the consumer's (binomial) risk for p = 0.08 is as near as possible to 10% without being larger than 10%, i.e. we want to solve the equation B(5,n,0.08) = 0.10. According to Example 1 the solution is n = 113.8, and since B(c,n,p) is a decreasing function of n the value found should be rounded up to the nearest integer, i.e. n = 114.

Example 4. Significance limits for the number of trials in a Pascal distribution.

Let G(c,n,p) denote the probability that a Bernoulli trial must be repeated at most n times in order to make the event occur exactly c times. Since the cumulative Pascal distribution G(c,n,p) = 1 - B(c-1,n,p) we may use the table to find significance limits for n.

To find the 5% and 95% significance limits corresponding to c = 6 and p = 0.10 we solve the equations B(5,n,0.10) = 0.95 and B(5,n,0.10) = 0.05 which give n = 27.38 and n = 102.4, respectively. Consequently the 5% significance limit for n equals 27 and the 95% limit equals 103, so that the probability is slightly more than 90% that the event in question will occur for the 6th time between the 27th and the 103rd trial, both included.

4. Examples of determination of p.

For given values of c, n and P we may find p from (3).

Example 5. The binomial operating characteristic for a given sampling plan.

Let a single sampling plan be defined by the sample size n = 150 and the acceptance number c = 4. We want to determine the binomial operating characteristic P(p) = B(c,n,p), which gives the average probability of accepting lots produced by a binomial process with fraction defective (process average) equal to p.

From the table 15 values of the operating characteristic may be determined by means of formula (3). Example 1 shows how the 10% point, 100p = 5.260, is found. All 15 values are given in the following table.

Solutions of the equation B(4,150,p) = P.

100P	100p	100P	100p
99.9	0.4984	20.0	4.442
99.5	0.7254	10.0	5.260
99.0	0.8601	5.0	6.000
97.5	1.091	2.5	6.689
95.0	1.322	1.0	7.545
90.0	1.630	0.5	8.161
80.0	2.066	0.1	9.517
50.0	3.107		

If other values of the operating characteristic are needed it will be necessary to use the method of interpolation shown in the last part of Example 2.

Example 6. The binomial operating characteristic for a given sampling plan with small sample size.

If the sample size is small it may happen that the value of p corresponding to a small value of P is larger than 0.5. In such cases we use the relation B(c,n,p) = 1 - B(n-c-1, n, 1-p), i.e. we solve the equation B(n-c-1, n, 1-p) = 1-P with respect to 1-p.

As an example consider the case n = 10 and c = 2. For P ≧ 0.10 we use the same procedure as in Example 5. Since c = 2 we have, however, used the special table to obtain greater accuracy.

For P ≦ 0.05 we find p > 0.5, and we therefore have to solve the equation B(7, 10, 1-p) = 1-P. The results have been given in the following table.

Solutions of the equation B(2,10,p) = P.

100P	100p	100P	100(1-P)	100(1-p)	100p
99.9	2.102	5.0	95.0	49.31	50.69
99.5	3.701	2.5	97.5	44.39	55.61
99.0	4.750	1.0	99.0	38.84	61.16
97.5	6.672	0.5	99.5	35.16	64.84
95.0	8.720	0.1	99.9	28.16	71.84
90.0	11.58				
80.0	15.76				
50.0	25.85				
20.0	38.09				
10.0	44.96				

Example 7. Confidence limits for p in the binomial distribution.

Let us determine the 99% confidence interval for p corresponding to the observed relative frequency c/n = 4/150. The lower limit is determined from $1-B(3, 150, p_L) = 0.005$, and the upper limit from $B(4, 150, p_U) = 0.005$, which gives $p_L = 0.004516$ and $p_U = 0.08161$ by means of (3).

As another example consider a reliability experiment consisting of 500 trials resulting in 411 successes, say. We want to determine an upper limit p_U for the probability of a failure with a confidence of 80%, i.e. we want to solve the equation $B(89, 500, p_U) = 0.20$. From (3) we get $p_U = 0.1939$.

Example 8. Confidence limits for p in the Pascal distribution.

Let us determine the 99% confidence interval for p from the observation that the 4th failure (defective) occurs at the 150th trial, i.e. (c,n) = (4, 150) in the Pascal distribution, see Example 4. The lower limit is determined from $G(4, 150, p_L) = 0.005$, and the upper from $1 - G(4, 149, p_U) = 0.005$. This means that we have to solve the equations $B(3, 150, p_L) = 0.995$ and $B(3, 149, p_U) = 0.005$, which lead to $p_L = 0.004516$ and $p_U = 0.07174$.

5. Examples of determination of c.

For given values of n, p and P the equation $B(c,n,p) = P$ will usually not have a solution with respect to c if c has to be an integer. We therefore define c as the solution to the corresponding inequality $B(c,n,p) \leq P < B(c+1, n, p)$.

By inspection of the table for the given P and by interpolation we may determine c and $n_1 \leq n < n_2$ so that $B(c,n_1,p) = B(c+1, n_2, p) = P$. Since B(c,n,p) is a decreasing function of n this equality is equivalent to the inequality sought for.

Example 9. The acceptance number corresponding to a given sample size, quality level and acceptance probability.

Let us determine the acceptance number corresponding to a sample size of n = 150 so that the consumer's binomial risk equals 10% for p = 0.04 i.e. $B(c, 150, 0.04) = 0.10$. From (4) we get $B(2, 131.4, 0.04) = B(3, 165.2, 0.04) = 0.10$ so that $B(2, 150, 0.04) < 0.10 < B(3, 150, 0.04)$. Thus c = 2 is the acceptance number giving a consumer's risk closest to 10% without being larger than 10%.

Example 10. Significance limits for the number of successes in a binomial distribution.

Let us determine the 5% and 95% significance limits in the binomial distribution for n = 150 and p = 0.05. Since $B(2, 123.8, 0.05) = B(3, 152.7, 0.05) = 0.05$ and $B(11, 140.5, 0.05) = B(12, 155.9, 0.05) = 0.95$ we have $B(2, 150, 0.05) < 0.05 < B(3, 150, 0.05)$ and $B(11, 150, 0.05) < 0.95 < B(12, 150, 0.05)$.

6. Examples of determination of a relation between c and n.

In some problems we have only specified p and P so that the equation $B(c,n,p) = P$ defines a relation between c and n. In that case n may be found as a function of c by chosing successive values of c and determining corresponding values of n as described in section 3.

Example 11. Determination of a sampling plan with given producer's and consumer's risk.

A single sampling plan may be determined by specifying two risks or equivalently by setting $B(c,n,p_1) \geq 1 - \alpha$ and $B(c,n,p_2) \leq \beta$ for given $p_1 < p_2$ and $1 - \alpha > \beta$. The solution should be determined so that the probabilities are as close as possible to the values specified. Each of the two "equations" defines a relation between c and n, and the problem is to find the domain where both "equations" are satisfied.

By chosing suitable values of c and finding the corresponding two values of n we may find the solution as shown in the following example for $p_1 = 0.01$, $p_2 = 0.05$, $\alpha = 0.05$ and $\beta = 0.10$.

	$B(c,n,p_1)$ $=0.95$ ≥ 0.95		$B(c,n,p_2)$ $=0.10$ ≤ 0.10		$B(c,n,p_1) \geq 0.95$ and $B(c,n,p_2) \leq 0.10$
c	n =	n ≦	n =	n ≧	n
2	82.36	82	104.8	105	None
3	137.1	137	131.8	132	$132 \leq n \leq 137$
4	198.0	198	157.9	158	$158 \leq n \leq 198$

Thus, the smallest value of c for which both conditions are satisfied is $c = 3$, and all values of n between 132 and 137 will satisfy the requirements for $c = 3$.

Example 12. IQL sampling plans with decreasing producer's risk.

Suppose that a break-even quality p_0 has been fixed and that $B(c,n,p_0) = 0.5$. Let us further assume that the producer's risk for a process average of $p_1 < p_0$ is defined as a decreasing function of lot size N, for instance as α/N as discussed by Hald (1965). The plan corresponding to any lot size is then determined from the two conditions $B(c,n,p_0) = 0.5$ and $B(c,n,p_1) = 1 - \alpha/N$.

To tabulate such a system of sampling plans we first find $n = n_c$ as a function of c from the first condition. This may be done from the table or with good approximation from (6) which gives $np_0 \cong c + (2-p_0)/3$.

Because of the discreteness of c the second condition must be rewritten as $B(c,n_c,p_1) \geq 1 - \alpha/N > B(c-1, n_{c-1}, p_1)$. Defining $N_c = \alpha/[1 - B(c,n_c,p_1)]$ we find that the second condition is satisfied for $N_{c-1} < N \leq N_c$.

To compute N_c it is necessary to interpolate for $B(c,n_c,p_1)$ as shown in section 2.

The following table shows an example for $\alpha = 40$, $p_1 = 1.2\%$ and $p_0 = 4\%$.

c	n_c	$100(1-B(c,n_c,p_1))$ Linear interpol.	Quadratic interpol.	Exact	N_c Linear	Quadratic	Exact
0	17	18.483	18.547	18.554	216	216	216
1	42	9.127	9.072	9.050	438	441	442
2	67	4.738	4.698	4.695	844	851	852
3	91	2.448	2.432	2.432	1634	1640	1640
4	116	1.425	1.343	1.333	2810	2980	3000
5	141	0.772	0.735	0.741	5180	5440	5400
6	166	0.447	0.412	0.416	8950	9710	9620
7	191	0.296	0.216	0.235	13500	18500	17000

The table shows e.g. that the plan $(c,n) = (5,141)$ shall be used for $3000 < N \leq 5400$ since $B(5, 141, 0.04) = 0.50$ and

$$1 - B(5, 141, 0.012) = 0.00741 \leq 40/N < 1 - B(4, 116, 0.012) = 0.01333.$$

The table also illustrates the accuracy of linear and quadratic interpolation.

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References.

A. Hald (1965): Bayesian single sampling attribute plans for discrete prior distributions. Mat. Fys. Skr. Dan. Vid. Selsk., 3, No. 2, Munksgaard, Copenhagen.

A. Hald (1966): The determination of single sampling attribute plans with given producer's and consumer's risk. Duplicated report.

Table of n satisfying the equation B(c,n,p)= 0.001

100p

c	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
0	6905	687.4	342.0	134.7	95.19	65.57	42.51	30.96
1	9230	919.3	457.6	180.6	127.8	88.15	57.33	41.90
2	11230	1119	556.9	220.0	155.8	107.6	70.12	51.35
3	13060	1302	648.1	256.2	181.6	125.5	81.91	60.08
4	14790	1475	734.3	290.5	205.9	142.5	93.07	68.36
5	16450	1640	817.0	323.4	229.3	158.8	103.8	76.31
6	18060	1801	897.1	355.2	252.0	174.5	114.2	84.03
7	19620	1957	975.0	386.2	274.0	189.9	124.4	91.55
8	21150	2110	1052	416.5	295.6	204.9	134.3	98.92
9	22660	2259	1127	446.3	316.8	219.7	144.1	106.2
10	24130	2407	1200	475.6	337.7	234.2	153.7	113.3
11	25590	2552	1273	504.5	358.2	248.5	163.1	120.4
12	27020	2696	1344	533.0	378.5	262.6	172.5	127.3
13	28440	2837	1415	561.2	398.6	276.6	181.7	134.2
14	29850	2978	1485	589.1	418.5	290.5	190.9	141.0
15	31240	3117	1555	616.7	438.1	304.2	200.0	147.8
16	32620	3255	1623	644.1	457.7	317.8	209.0	154.5
17	33990	3391	1692	671.3	477.0	331.3	217.9	161.1
18	35350	3527	1759	698.3	496.3	344.7	226.8	167.7
19	36700	3662	1827	725.1	515.4	358.0	235.6	174.3
20	38040	3796	1894	751.8	534.3	371.3	244.3	180.8
21	39370	3929	1960	778.3	553.2	384.4	253.1	187.3
22	40700	4061	2026	804.6	572.0	397.5	261.7	193.8
23	42010	4193	2092	830.8	590.7	410.5	270.3	200.2
24	43330	4324	2157	856.9	609.2	423.5	278.9	206.6
25	44630	4454	2222	882.8	627.7	436.4	287.5	213.0
26	45930	4584	2287	908.7	646.2	449.2	296.0	219.3
27	47230	4713	2352	934.4	664.5	462.0	304.5	225.6
28	48510	4842	2416	960.1	682.8	474.8	312.9	231.9
29	49800	4970	2480	985.6	701.0	487.5	321.3	238.2
30	51080	5098	2544	1012	719.1	500.1	329.7	244.4
31	52350	5226	2608	1037	737.2	512.7	338.1	250.7
32	53620	5353	2671	1062	755.2	525.3	346.4	256.9
33	54890	5479	2734	1087	773.2	537.8	354.7	263.1
34	56150	5605	2797	1112	791.1	550.3	363.0	269.2
35	57410	5731	2860	1138	808.9	562.8	371.2	275.4
36	58670	5856	2923	1163	826.7	575.2	379.5	281.5
37	59920	5982	2985	1187	844.5	587.6	387.7	287.7
38	61170	6106	3048	1212	862.2	599.9	395.9	293.8
39	62410	6231	3110	1237	879.9	612.3	404.1	299.9
40	63660	6355	3172	1262	897.5	624.6	412.2	306.0
41	64890	6479	3234	1286	915.1	636.8	420.4	312.0
42	66130	6602	3295	1311	932.6	649.1	428.5	318.1
43	67370	6726	3357	1336	950.1	661.3	436.6	324.1
44	68600	6849	3418	1360	967.6	673.5	444.7	330.2
45	69830	6971	3480	1385	985.1	685.7	452.8	336.2
46	71050	7094	3541	1409	1003	697.8	460.8	342.2
47	72280	7216	3602	1433	1020	710.0	468.9	348.2
48	73500	7338	3663	1458	1038	722.1	476.9	354.2
49	74720	7460	3724	1482	1055	734.1	484.9	360.2
50	75930	7582	3785	1506	1072	746.2	492.9	366.2

Table of n satisfying the equation B(c,n,p)= 0.001

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
0	30.96	24.02	19.37	16.04	13.53	11.56	9.966
1	41.90	32.62	26.41	21.96	18.61	15.98	13.86
2	51.35	40.07	32.53	27.12	23.04	19.85	17.28
3	60.08	46.96	38.19	31.90	27.16	23.46	20.47
4	68.36	53.50	43.57	36.45	31.09	26.89	23.51
5	76.31	59.79	48.74	40.83	34.87	30.21	26.45
6	84.03	65.89	53.77	45.09	38.55	33.43	29.31
7	91.55	71.85	58.68	49.25	42.14	36.59	32.11
8	98.92	77.69	63.49	53.33	45.67	39.69	34.87
9	106.2	83.42	68.23	57.34	49.14	42.74	37.58
10	113.3	89.08	72.89	61.30	52.57	45.75	40.25
11	120.4	94.65	77.50	65.20	55.95	48.72	42.90
12	127.3	100.2	82.05	69.07	59.30	51.66	45.52
13	134.2	105.7	86.55	72.89	62.61	54.58	48.11
14	141.0	111.1	91.02	76.69	65.90	57.47	50.69
15	147.8	116.4	95.45	80.45	69.16	60.34	53.24
16	154.5	121.7	99.84	84.18	72.40	63.19	55.78
17	161.1	127.0	104.2	87.89	75.61	66.02	58.31
18	167.7	132.3	108.6	91.57	78.81	68.84	60.82
19	174.3	137.5	112.9	95.24	81.99	71.64	63.31
20	180.8	142.7	117.2	98.88	85.15	74.42	65.79
21	187.3	147.8	121.4	102.5	88.29	77.19	68.27
22	193.8	152.9	125.7	106.2	91.42	79.95	70.73
23	200.2	158.0	129.9	109.7	94.54	82.70	73.18
24	206.6	163.1	134.1	113.3	97.64	85.44	75.62
25	213.0	168.2	138.3	116.9	100.8	88.16	78.05
26	219.3	173.2	142.5	120.4	103.9	90.88	80.48
27	225.6	178.2	146.6	124.0	106.9	93.59	82.89
28	231.9	183.2	150.8	127.5	110.0	96.29	85.30
29	238.2	188.2	154.9	131.0	113.0	98.98	87.71
30	244.4	193.2	159.0	134.5	116.1	101.7	90.10
31	250.7	198.2	163.1	138.0	119.1	104.4	92.49
32	256.9	203.1	167.2	141.5	122.1	107.1	94.88
33	263.1	208.0	171.3	144.9	125.2	109.7	97.25
34	269.2	212.9	175.3	148.4	128.2	112.4	99.63
35	275.4	217.8	179.4	151.9	131.2	115.0	102.0
36	281.5	222.7	183.4	155.3	134.2	117.7	104.4
37	287.7	227.6	187.5	158.8	137.2	120.3	106.8
38	293.8	232.4	191.5	162.2	140.1	122.9	109.1
39	299.9	237.3	195.5	165.6	143.1	125.6	111.5
40	306.0	242.1	199.5	169.0	146.1	128.2	113.8
41	312.0	247.0	203.5	172.4	149.0	130.8	116.1
42	318.1	251.8	207.5	175.8	152.0	133.4	118.5
43	324.1	256.6	211.5	179.2	155.0	136.0	120.8
44	330.2	261.4	215.5	182.6	157.9	138.6	123.1
45	336.2	266.2	219.5	186.0	160.9	141.2	125.5
46	342.2	271.0	223.4	189.4	163.8	143.8	127.8
47	348.2	275.8	227.4	192.8	166.7	146.4	130.1
48	354.2	280.5	231.3	196.1	169.7	149.0	132.4
49	360.2	285.3	235.3	199.5	172.6	151.6	134.7
50	366.2	290.0	239.2	202.8	175.5	154.2	137.0

Table of n satisfying the equation B(c,n,p)= 0.001

c	100p 0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
51	77150	7703	3845	1530	1089	758.2	500.9	372.1
52	78360	7824	3906	1555	1107	770.3	508.9	378.1
53	79570	7945	3966	1579	1124	782.3	516.8	384.0
54	80780	8066	4027	1603	1141	794.3	524.8	390.0
55	81990	8187	4087	1627	1158	806.2	532.7	395.9
56	83190	8307	4147	1651	1175	818.2	540.7	401.8
57	84400	8427	4207	1675	1192	830.1	548.6	407.7
58	85600	8548	4267	1699	1209	842.0	556.5	413.6
59	86800	8667	4327	1723	1226	853.9	564.4	419.5
60	88000	8787	4387	1746	1244	865.3	572.3	425.4
61	89200	8907	4447	1770	1261	877.7	580.1	431.3
62	90390	9026	4506	1794	1277	889.5	588.0	437.2
63	91580	9145	4566	1818	1294	901.4	595.9	443.0
64	92780	9265	4625	1842	1311	913.2	603.7	448.9
65	93970	9384	4685	1865	1328	925.0	611.6	454.7
66	95160	9502	4744	1889	1345	936.8	619.4	460.6
67	96340	9621	4803	1913	1362	948.6	627.2	466.4
68	97530	9740	4863	1936	1379	960.3	635.0	472.3
69	98720	9858	4922	1960	1396	972.1	642.8	478.1
70	99900	9976	4981	1984	1413	983.8	650.6	483.9
71	101100	10100	5040	2007	1429	995.6	658.4	489.7
72	102300	10220	5099	2031	1446	1008	666.2	495.5
73	103500	10340	5158	2054	1463	1019	674.0	501.3
74	104700	10450	5217	2078	1480	1031	681.7	507.1
75	105800	10570	5276	2101	1496	1043	689.5	512.9
76	107000	10690	5334	2125	1513	1055	697.2	518.7
77	108200	10810	5393	2148	1530	1066	705.0	524.5
78	109400	10920	5452	2171	1547	1078	712.7	530.3
79	110500	11040	5510	2195	1563	1089	720.5	536.1
80	111700	11160	5569	2218	1580	1101	728.2	541.8
81	112900	11270	5627	2241	1596	1113	735.9	547.6
82	114100	11390	5686	2265	1613	1124	743.6	553.4
83	115200	11510	5744	2288	1630	1136	751.3	559.1
84	116400	11620	5802	2311	1646	1148	759.0	564.9
85	117600	11740	5860	2335	1663	1159	766.7	570.6
86	118700	11860	5919	2358	1679	1171	774.4	576.4
87	119900	11970	5977	2381	1696	1182	782.1	582.1
88	121100	12090	6035	2404	1713	1194	789.8	587.8
89	122200	12210	6093	2427	1729	1205	797.4	593.6
90	123400	12320	6151	2451	1746	1217	805.1	599.3
91	124500	12440	6209	2474	1762	1228	812.7	605.0
92	125700	12560	6267	2497	1779	1240	820.4	610.7
93	126900	12670	6325	2520	1795	1251	828.0	616.4
94	128000	12790	6383	2543	1812	1263	835.7	622.1
95	129200	12900	6441	2566	1828	1274	843.3	627.9
96	130300	13020	6498	2589	1845	1286	851.0	633.6
97	131500	13130	6556	2612	1861	1297	858.6	639.3
98	132600	13250	6614	2635	1877	1309	866.2	645.0
99	133800	13360	6672	2658	1894	1320	873.8	650.6
100	135000	13480	6729	2681	1910	1332	881.4	656.3

Table of n satisfying the equation B(c,n,p)= 0.001

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
51	372.1	294.8	243.1	206.2	178.4	156.7	139.3
52	378.1	299.5	247.1	209.5	181.3	159.3	141.6
53	384.0	304.3	251.0	212.9	184.2	161.9	143.9
54	390.0	309.0	254.9	216.2	187.1	164.5	146.2
55	395.9	313.7	258.8	219.6	190.0	167.0	148.5
56	401.8	318.4	262.7	222.9	192.9	169.6	150.8
57	407.7	323.1	266.6	226.2	195.8	172.1	153.1
58	413.6	327.8	270.5	229.5	198.7	174.7	155.4
59	419.5	332.5	274.4	232.9	201.6	177.2	157.7
60	425.4	337.2	278.3	236.2	204.5	179.8	160.0
61	431.3	341.9	282.2	239.5	207.4	182.3	162.2
62	437.2	346.6	286.1	242.8	210.3	184.9	164.5
63	443.0	351.2	289.9	246.1	213.1	187.4	166.8
64	448.9	355.9	293.8	249.4	216.0	190.0	169.1
65	454.7	360.6	297.7	252.7	218.9	192.5	171.3
66	460.6	365.2	301.5	256.0	221.7	195.0	173.6
67	466.4	369.9	305.4	259.3	224.6	197.6	175.9
68	472.3	374.5	309.3	262.6	227.5	200.1	178.1
69	478.1	379.1	313.1	265.9	230.3	202.6	180.4
70	483.9	383.8	316.9	269.1	233.2	205.2	182.6
71	489.7	388.4	320.8	272.4	236.0	207.7	184.9
72	495.5	393.0	324.6	275.7	238.9	210.2	187.2
73	501.3	397.7	328.5	279.0	241.7	212.7	189.4
74	507.1	402.3	332.3	282.2	244.6	215.2	191.7
75	512.9	406.9	336.1	285.5	247.4	217.7	193.9
76	518.7	411.5	340.0	288.8	250.3	220.3	196.2
77	524.5	416.1	343.8	292.0	253.1	222.8	198.4
78	530.3	420.7	347.6	295.3	256.0	225.3	200.7
79	536.1	425.3	351.4	298.5	258.8	227.8	202.9
80	541.8	429.9	355.2	301.8	261.6	230.3	205.2
81	547.6	434.5	359.0	305.0	264.5	232.8	207.4
82	553.4	439.1	362.8	308.3	267.3	235.3	209.6
83	559.1	443.7	366.6	311.5	270.1	237.8	211.9
84	564.9	448.3	370.5	314.8	272.9	240.3	214.1
85	570.6	452.9	374.3	318.0	275.8	242.8	216.3
86	576.4	457.4	378.0	321.3	278.6	245.3	218.6
87	582.1	462.0	381.8	324.5	281.4	247.8	220.8
88	587.8	466.6	385.6	327.7	284.2	250.3	223.0
89	593.6	471.1	389.4	331.0	287.0	252.8	225.3
90	599.3	475.7	393.2	334.2	289.8	255.3	227.5
91	605.0	480.3	397.0	337.4	292.7	257.8	229.7
92	610.7	484.8	400.8	340.7	295.5	260.2	232.0
93	616.4	489.4	404.6	343.9	298.3	262.7	234.2
94	622.1	493.9	408.3	347.1	301.1	265.2	236.4
95	627.9	498.5	412.1	350.3	303.9	267.7	238.6
96	633.6	503.0	415.9	353.5	306.7	270.2	240.9
97	639.3	507.5	419.6	356.8	309.5	272.7	243.1
98	645.0	512.1	423.4	360.0	312.3	275.1	245.3
99	650.6	516.6	427.2	363.2	315.1	277.6	247.5
100	656.3	521.2	430.9	366.4	317.9	280.1	249.7

Table 1. p satisfying the equation B(c,n,p) = 0.05

c	100p							
	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
0	5296	527.2	262.3	103.3	73.01	50.29	32.61	23.75
1	7427	739.8	368.3	145.4	102.9	71.03	46.23	33.82
2	9271	923.8	460.1	181.9	128.8	89.04	58.09	42.59
3	10980	1094	544.9	215.6	152.8	105.8	69.08	50.74
4	12590	1256	625.4	247.6	175.6	121.6	79.54	58.50
5	14150	1411	702.9	278.4	197.6	136.9	89.62	65.99
6	15660	1562	778.2	308.4	218.9	151.7	99.42	73.27
7	17130	1709	851.6	337.6	239.7	166.2	109.0	80.39
8	18580	1853	923.7	366.3	260.1	180.4	118.4	87.38
9	20000	1995	994.5	394.5	280.2	194.4	127.7	94.26
10	21400	2135	1065	422.2	300.0	208.2	136.8	101.1
11	22780	2273	1134	449.7	319.5	221.8	145.8	107.8
12	24140	2409	1202	476.8	338.8	235.3	154.7	114.4
13	25500	2544	1269	503.7	357.9	248.6	163.6	121.0
14	26830	2678	1336	530.3	376.9	261.9	172.3	127.5
15	28160	2810	1402	556.7	395.7	275.0	181.0	134.0
16	29480	2942	1468	582.9	414.4	288.0	189.6	140.4
17	30790	3073	1533	608.9	432.9	300.9	198.2	146.8
18	32090	3203	1598	634.7	451.3	313.8	206.7	153.1
19	33380	3332	1662	660.4	469.6	326.5	215.2	159.4
20	34670	3460	1727	686.0	487.9	339.2	223.6	165.7
21	35940	3588	1790	711.4	506.0	351.9	232.0	172.0
22	37220	3715	1854	736.7	524.0	364.5	240.3	178.2
23	38480	3841	1917	761.9	542.0	377.0	248.6	184.4
24	39740	3967	1980	787.0	559.8	389.5	256.9	190.5
25	41000	4093	2042	812.0	577.6	401.9	265.1	196.7
26	42250	4217	2105	836.9	595.4	414.3	273.3	202.8
27	43490	4342	2167	861.6	613.1	426.6	281.5	208.9
28	44740	4466	2229	886.4	630.7	438.9	289.6	215.0
29	45970	4590	2291	911.0	648.2	451.1	297.8	221.0
30	47210	4713	2352	935.5	665.7	463.3	305.9	227.1
31	48440	4836	2414	960.0	683.2	475.5	314.0	233.1
32	49660	4958	2475	984.4	700.6	487.7	322.0	239.1
33	50880	5080	2536	1009	717.9	499.8	330.0	245.1
34	52100	5202	2597	1033	735.2	511.9	338.1	251.1
35	53320	5324	2657	1058	752.5	523.9	346.1	257.1
36	54530	5445	2718	1082	769.7	535.9	354.0	263.0
37	55740	5566	2778	1106	786.9	547.9	362.0	269.0
38	56950	5687	2839	1130	804.1	559.9	369.9	274.9
39	58160	5807	2899	1154	821.2	571.9	377.9	280.8
40	59360	5927	2959	1178	838.3	583.8	385.8	286.7
41	60560	6047	3019	1202	855.3	595.7	393.7	292.6
42	61760	6167	3079	1226	872.3	607.6	401.6	298.5
43	62950	6286	3138	1250	889.3	619.4	409.4	304.4
44	64140	6405	3198	1273	906.2	631.2	417.3	310.2
45	65340	6524	3257	1297	923.2	643.1	425.1	316.1
46	66520	6643	3317	1321	940.0	654.8	433.0	321.9
47	67710	6762	3376	1344	956.9	666.6	440.8	327.8
48	68900	6880	3435	1368	973.7	678.4	448.6	333.6
49	70080	6998	3494	1392	990.6	690.1	456.4	339.4
50	71260	7116	3553	1415	1008	701.8	464.1	345.2

Table of p satisfying the equation B(c,n,p) = 0.950

Table of n satisfying the equation $B(c,n,p) = 0.005$

c	100p = 20.0	25.0	30.0	35.0	40.0	45.0	50.0
0	23.75	18.42	14.86	12.30	10.38	8.863	7.644
1	33.82	26.35	21.36	17.78	15.08	12.97	11.26
2	42.59	33.28	27.05	22.58	19.22	16.59	14.47
3	50.74	39.72	32.35	27.07	23.09	19.98	17.47
4	58.50	45.85	37.40	31.35	26.78	23.22	20.34
5	65.99	51.78	42.29	35.49	30.36	26.36	23.13
6	73.27	57.55	47.04	39.52	33.85	29.42	25.86
7	80.39	63.19	51.70	43.47	37.27	32.43	28.53
8	87.38	68.73	56.27	47.35	40.64	35.39	31.16
9	94.26	74.19	60.78	51.18	43.95	38.30	33.76
10	101.1	79.57	65.23	54.96	47.22	41.18	36.32
11	107.8	84.89	69.63	58.69	50.46	44.04	38.86
12	114.4	90.16	73.98	62.39	53.67	46.86	41.38
13	121.0	95.38	78.30	66.06	56.86	49.67	43.88
14	127.5	100.6	82.58	69.70	60.01	52.45	46.36
15	134.0	105.7	86.82	73.31	63.15	55.21	48.83
16	140.4	110.8	91.05	76.90	66.27	57.96	51.28
17	146.8	115.9	95.24	80.47	69.36	60.69	53.72
18	153.1	120.9	99.41	84.02	72.45	63.41	56.14
19	159.4	126.0	103.6	87.55	75.51	66.11	58.55
20	165.7	130.9	107.7	91.07	78.56	68.80	60.96
21	172.0	135.9	111.8	94.57	81.60	71.49	63.35
22	178.2	140.9	115.9	98.05	84.63	74.16	65.74
23	184.4	145.8	120.0	101.6	87.65	76.82	68.11
24	190.5	150.7	124.1	105.0	90.65	79.47	70.48
25	196.7	155.6	128.1	108.5	93.65	82.11	72.85
26	202.8	160.4	132.1	111.9	96.63	84.75	75.20
27	208.9	165.3	136.2	115.3	99.61	87.38	77.55
28	215.0	170.1	140.2	118.7	102.6	90.00	79.89
29	221.0	174.9	144.2	122.1	105.6	92.61	82.23
30	227.1	179.8	148.2	125.5	108.5	95.22	84.56
31	233.1	184.6	152.1	128.9	111.5	97.82	86.88
32	239.1	189.3	156.1	132.3	114.4	100.5	89.20
33	245.1	194.1	160.0	135.7	117.4	103.1	91.52
34	251.1	198.9	164.0	139.0	120.3	105.6	93.83
35	257.1	203.6	167.9	142.4	123.2	108.2	96.14
36	263.0	208.4	171.9	145.7	126.1	110.8	98.44
37	269.0	213.1	175.8	149.1	129.0	113.4	100.8
38	274.9	217.8	179.7	152.4	131.9	115.9	103.1
39	280.8	222.5	183.6	155.8	134.8	118.5	105.4
40	286.7	227.2	187.5	159.1	137.7	121.0	107.7
41	292.6	231.9	191.4	162.4	140.6	123.6	109.9
42	298.5	236.6	195.3	165.7	143.5	126.1	112.2
43	304.4	241.3	199.2	169.0	146.4	128.7	114.5
44	310.2	245.9	203.0	172.3	149.2	131.2	116.8
45	316.1	250.6	206.9	175.6	152.1	133.8	119.0
46	321.9	255.3	210.8	178.9	155.0	136.3	121.3
47	327.8	259.9	214.6	182.2	157.8	138.8	123.6
48	333.6	264.5	218.5	185.5	160.7	141.4	125.8
49	339.4	269.2	222.3	188.8	163.5	143.9	128.1
50	345.2	273.8	226.1	192.0	166.4	146.4	130.3

Table of n satisfying the equation B(c,n,p)= 0.005

100p

c	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
51	72440	7234	3612	1439	1025	713.5	471.9	351.0
52	73620	7352	3671	1462	1041	725.2	479.7	356.8
53	74790	7470	3730	1485	1058	736.9	487.4	362.6
54	75970	7587	3788	1509	1075	748.6	495.2	368.4
55	77140	7704	3847	1532	1091	760.2	502.9	374.2
56	78310	7821	3905	1556	1108	771.8	510.6	379.9
57	79480	7938	3964	1579	1125	783.4	518.3	385.7
58	80650	8055	4022	1602	1141	795.0	526.0	391.4
59	81820	8171	4080	1625	1158	806.6	533.7	397.2
60	82980	8288	4138	1649	1174	818.2	541.4	402.9
61	84150	8404	4197	1672	1191	829.7	549.1	408.7
62	85310	8521	4255	1695	1207	841.3	556.8	414.4
63	86470	8637	4313	1718	1224	852.8	564.4	420.1
64	87630	8753	4371	1741	1240	864.3	572.1	425.8
65	88790	8868	4428	1764	1257	875.9	579.7	431.6
66	89950	8984	4486	1788	1273	887.4	587.3	437.3
67	91110	9100	4544	1811	1290	898.8	595.0	443.0
68	92260	9215	4602	1834	1306	910.3	602.6	448.7
69	93420	9331	4659	1857	1323	921.8	610.2	454.3
70	94570	9446	4717	1880	1339	933.2	617.8	460.0
71	95720	9561	4775	1903	1355	944.7	625.4	465.7
72	96870	9676	4832	1926	1372	956.1	633.0	471.4
73	98020	9791	4889	1948	1388	967.5	640.6	477.1
74	99170	9906	4947	1971	1405	979.0	648.2	482.7
75	100400	10030	5004	1994	1421	990.4	655.8	488.4
76	101500	10140	5061	2017	1437	1002	663.4	494.1
77	102700	10250	5119	2040	1454	1014	670.9	499.7
78	103800	10370	5176	2063	1470	1025	678.5	505.4
79	104900	10480	5233	2086	1486	1036	686.0	511.0
80	106100	10600	5290	2108	1502	1048	693.6	516.6
81	107200	10710	5347	2131	1519	1059	701.1	522.3
82	108400	10830	5404	2154	1535	1070	708.7	527.9
83	109500	10940	5461	2177	1551	1082	716.2	533.6
84	110700	11050	5518	2199	1567	1093	723.7	539.2
85	111800	11170	5575	2222	1583	1104	731.3	544.8
86	112900	11280	5632	2245	1600	1116	738.8	550.4
87	114100	11400	5689	2268	1616	1127	746.3	556.0
88	115200	11510	5746	2290	1632	1138	753.8	561.6
89	116300	11620	5802	2313	1648	1150	761.3	567.3
90	117500	11740	5859	2336	1664	1161	768.8	572.9
91	118600	11850	5916	2358	1680	1172	776.3	578.5
92	119800	11960	5972	2381	1697	1183	783.8	584.1
93	120900	12080	6029	2403	1713	1195	791.3	589.7
94	122000	12190	6085	2426	1729	1206	798.7	595.3
95	123100	12300	6142	2449	1745	1217	806.2	600.8
96	124300	12420	6198	2471	1761	1228	813.7	606.4
97	125400	12530	6255	2494	1777	1240	821.2	612.0
98	126500	12640	6311	2516	1793	1251	828.6	617.6
99	127700	12750	6368	2539	1809	1262	836.1	623.2
100	128800	12870	6424	2561	1825	1273	843.5	628.7

Table of n satisfying the equation B(c,n,p)= 0.005

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
51	351.0	278.4	230.0	195.3	169.2	148.9	132.6
52	356.8	283.0	233.8	198.6	172.1	151.4	134.9
53	362.6	287.7	237.6	201.8	174.9	153.9	137.1
54	368.4	292.3	241.4	205.1	177.8	156.5	139.3
55	374.2	296.9	245.3	208.3	180.6	159.0	141.6
56	379.9	301.5	249.1	211.6	183.4	161.5	143.8
57	385.7	306.0	252.9	214.8	186.3	164.0	146.1
58	391.4	310.6	256.7	218.1	189.1	166.5	148.3
59	397.2	315.2	260.5	221.3	191.9	169.0	150.6
60	402.9	319.8	264.3	224.6	194.7	171.5	152.8
61	408.7	324.4	268.1	227.8	197.6	174.0	155.0
62	414.4	328.9	271.9	231.0	200.4	176.4	157.2
63	420.1	333.5	275.6	234.3	203.2	178.9	159.5
64	425.8	338.0	279.4	237.5	206.0	181.4	161.7
65	431.6	342.6	283.2	240.7	208.8	183.9	163.9
66	437.3	347.1	287.0	243.9	211.6	186.4	166.2
67	443.0	351.7	290.7	247.2	214.4	188.9	168.4
68	448.7	356.2	294.5	250.4	217.2	191.4	170.6
69	454.3	360.7	298.3	253.6	220.0	193.8	172.8
70	460.0	365.3	302.0	256.8	222.8	196.3	175.0
71	465.7	369.8	305.8	260.0	225.6	198.8	177.2
72	471.4	374.3	309.6	263.2	228.4	201.2	179.5
73	477.1	378.9	313.3	266.4	231.2	203.7	181.7
74	482.7	383.4	317.1	269.6	234.0	206.2	183.9
75	488.4	387.9	320.8	272.8	236.8	208.7	186.1
76	494.1	392.4	324.5	276.0	239.6	211.1	188.3
77	499.7	396.9	328.3	279.2	242.3	213.6	190.5
78	505.4	401.4	332.0	282.4	245.1	216.0	192.7
79	511.0	405.9	335.8	285.6	247.9	218.5	194.9
80	516.6	410.4	339.5	288.8	250.7	221.0	197.1
81	522.3	414.9	343.2	292.0	253.4	223.4	199.3
82	527.9	419.4	347.0	295.2	256.2	225.9	201.5
83	533.6	423.9	350.7	298.3	259.0	228.3	203.7
84	539.2	428.4	354.4	301.5	261.8	230.8	205.9
85	544.8	432.8	358.1	304.7	264.5	233.2	208.1
86	550.4	437.3	361.9	307.9	267.3	235.7	210.3
87	556.0	441.8	365.6	311.0	270.1	238.1	212.5
88	561.6	446.3	369.3	314.2	272.8	240.6	214.7
89	567.3	450.7	373.0	317.4	275.6	243.0	216.9
90	572.9	455.2	376.7	320.6	278.4	245.5	219.1
91	578.5	459.7	380.4	323.7	281.1	247.9	221.3
92	584.1	464.1	384.1	326.9	283.9	250.4	223.5
93	589.7	468.6	387.8	330.1	286.6	252.8	225.7
94	595.3	473.1	391.5	333.2	289.4	255.2	227.8
95	600.8	477.5	395.2	336.4	292.2	257.7	230.0
96	606.4	482.0	398.9	339.5	294.9	260.1	232.2
97	612.0	486.4	402.6	342.7	297.7	262.6	234.4
98	617.6	490.9	406.3	345.8	300.4	265.0	236.6
99	623.2	495.3	410.0	349.0	303.2	267.4	238.8
100	628.7	499.8	413.7	352.2	305.9	269.9	241.0

Table of n satisfying the equation B(c,n,p)= 0.010

c	100p 0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
0	4603	458.3	228.0	89.79	63.46	43.71	28.34	20.64
1	6636	661.1	329.1	130.0	91.98	63.52	41.36	30.27
2	8403	837.4	417.1	164.9	116.9	80.80	52.75	38.70
3	10050	1001	498.8	197.4	140.0	96.87	63.34	46.56
4	11610	1157	576.5	228.3	162.0	112.2	73.45	54.07
5	13110	1307	651.4	258.1	183.2	127.0	83.22	61.32
6	14570	1453	724.3	287.1	203.9	141.4	92.72	68.39
7	16000	1596	795.5	315.5	224.1	155.5	102.1	75.31
8	17400	1736	865.5	343.4	243.9	169.3	111.2	82.11
9	18780	1874	934.3	370.8	263.4	182.9	120.2	88.81
10	20140	2010	1003	397.8	282.7	196.3	129.1	95.43
11	21490	2144	1070	424.5	301.7	209.6	137.9	102.0
12	22820	2277	1136	451.0	320.6	222.7	146.6	108.5
13	24140	2409	1202	477.2	339.2	235.8	155.2	114.9
14	25450	2539	1267	503.2	357.8	248.7	163.8	121.3
15	26740	2669	1332	529.0	376.1	261.5	172.3	127.6
16	28030	2798	1396	554.6	394.4	274.2	180.7	133.9
17	29310	2925	1460	580.0	412.5	286.9	189.1	140.2
18	30580	3052	1523	605.3	430.5	299.4	197.4	146.4
19	31840	3179	1586	630.5	448.5	311.9	205.7	152.6
20	33100	3304	1649	655.5	466.3	324.4	214.0	158.7
21	34350	3429	1712	680.4	484.1	336.8	222.2	164.8
22	35600	3554	1774	705.2	501.7	349.1	230.4	170.9
23	36840	3678	1836	729.9	519.3	361.4	238.5	177.0
24	38070	3801	1897	754.5	536.9	373.6	246.6	183.1
25	39310	3924	1959	779.0	554.3	385.8	254.7	189.1
26	40530	4047	2020	803.4	571.7	398.0	262.8	195.1
27	41750	4169	2081	827.7	589.1	410.1	270.8	201.1
28	42970	4291	2142	852.0	606.4	422.1	278.8	207.1
29	44190	4412	2202	876.2	623.6	434.2	286.8	213.0
30	45400	4533	2263	900.3	640.8	446.2	294.8	219.0
31	46610	4654	2323	924.3	658.0	458.2	302.7	224.9
32	47810	4774	2383	948.3	675.1	470.1	310.6	230.8
33	49010	4894	2443	972.2	692.1	482.0	318.5	236.7
34	50210	5014	2503	996.1	709.1	493.9	326.4	242.6
35	51400	5133	2563	1020	726.1	505.7	334.3	248.5
36	52600	5252	2622	1044	743.1	517.6	342.1	254.4
37	53790	5371	2682	1068	760.0	529.4	350.0	260.2
38	54980	5490	2741	1091	776.8	541.2	357.8	266.0
39	56160	5608	2800	1115	793.7	552.9	365.6	271.9
40	57340	5727	2859	1139	810.5	564.7	373.4	277.7
41	58520	5845	2918	1162	827.3	576.4	381.2	283.5
42	59700	5962	2977	1186	844.0	588.1	388.9	289.3
43	60880	6080	3036	1209	860.7	599.7	396.7	295.1
44	62050	6197	3094	1233	877.4	611.4	404.4	300.9
45	63230	6314	3153	1256	894.1	623.0	412.1	306.6
46	64400	6431	3211	1279	910.7	634.7	419.9	312.4
47	65570	6548	3270	1303	927.3	646.3	427.6	318.2
48	66730	6665	3328	1326	943.9	657.8	435.3	323.9
49	67900	6781	3386	1349	960.5	669.4	442.9	329.7
50	69060	6898	3444	1372	977.0	681.0	450.6	335.4

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
0	20.64	16.01	12.92	10.70	9.016	7.704	6.644
1	30.27	23.60	19.14	15.94	13.53	11.64	10.12
2	38.70	30.26	24.62	20.57	17.52	15.14	13.22
3	46.56	36.48	29.73	24.90	21.26	18.42	16.13
4	54.07	42.42	34.63	29.05	24.85	21.57	18.92
5	61.32	48.16	39.37	33.07	28.33	24.62	21.64
6	68.39	53.76	43.99	37.00	31.73	27.61	24.29
7	75.31	59.25	48.53	40.84	35.06	30.54	26.90
8	82.11	64.65	52.98	44.63	38.34	33.43	29.47
9	88.81	69.97	57.38	48.36	41.58	36.28	32.01
10	95.43	75.22	61.72	52.05	44.78	39.10	34.53
11	102.0	80.42	66.02	55.71	47.95	41.89	37.02
12	108.5	85.56	70.27	59.33	51.09	44.66	39.48
13	114.9	90.67	74.50	62.92	54.21	47.40	41.94
14	121.3	95.73	78.69	66.48	57.30	50.13	44.37
15	127.6	100.8	82.85	70.02	60.38	52.85	46.79
16	133.9	105.8	86.98	73.54	63.44	55.54	49.20
17	140.2	110.8	91.10	77.04	66.48	58.23	51.59
18	146.4	115.7	95.19	80.53	69.50	60.90	53.98
19	152.6	120.6	99.26	83.99	72.51	63.55	56.35
20	158.7	125.5	103.4	87.45	75.51	66.20	58.72
21	164.8	130.4	107.4	90.88	78.50	68.84	61.07
22	170.9	135.2	111.4	94.31	81.48	71.47	63.42
23	177.0	140.1	115.4	97.72	84.44	74.09	65.76
24	183.1	144.9	119.4	101.2	87.40	76.70	68.10
25	189.1	149.7	123.4	104.6	90.35	79.30	70.42
26	195.1	154.5	127.3	107.9	93.29	81.90	72.74
27	201.1	159.2	131.3	111.3	96.22	84.49	75.06
28	207.1	164.0	135.2	114.7	99.14	87.07	77.37
29	213.0	168.7	139.2	118.0	102.1	89.64	79.67
30	219.0	173.5	143.1	121.4	105.0	92.21	81.97
31	224.9	178.2	147.0	124.7	107.9	94.78	84.27
32	230.8	182.9	150.9	128.0	110.8	97.34	86.56
33	236.7	187.6	154.8	131.3	113.7	99.89	88.84
34	242.6	192.3	158.7	134.7	116.6	102.5	91.12
35	248.5	197.0	162.6	138.0	119.5	105.0	93.40
36	254.4	201.6	166.4	141.3	122.3	107.6	95.67
37	260.2	206.3	170.3	144.6	125.2	110.1	97.94
38	266.0	210.9	174.2	147.9	128.1	112.6	100.3
39	271.9	215.6	178.0	151.1	130.9	115.2	102.5
40	277.7	220.2	181.9	154.4	133.8	117.7	104.8
41	283.5	224.8	185.7	157.7	136.6	120.2	107.0
42	289.3	229.5	189.5	161.0	139.5	122.7	109.3
43	295.1	234.1	193.4	164.2	142.3	125.2	111.5
44	300.9	238.7	197.2	167.5	145.2	127.8	113.8
45	306.6	243.3	201.0	170.7	148.0	130.3	116.0
46	312.4	247.9	204.8	174.0	150.8	132.8	118.3
47	318.2	252.5	208.6	177.2	153.7	135.3	120.5
48	323.9	257.0	212.4	180.5	156.5	137.8	122.7
49	329.7	261.6	216.2	183.7	159.3	140.3	125.0
50	335.4	266.2	220.0	186.9	162.1	142.8	127.2

Table of n satisfying the equation B(c,n,p)= 0.010

c	100p 0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
51	70220	7014	3502	1395	993.6	692.5	458.3	341.1
52	71390	7130	3560	1418	1011	704.0	465.9	346.8
53	72540	7246	3618	1442	1027	715.5	473.6	352.5
54	73700	7361	3676	1465	1043	727.0	481.2	358.2
55	74860	7477	3734	1488	1060	738.5	488.9	363.9
56	76010	7592	3791	1511	1076	750.0	496.5	369.6
57	77170	7708	3849	1534	1093	761.4	504.1	375.3
58	78320	7823	3906	1557	1109	772.9	511.7	381.0
59	79470	7938	3964	1580	1125	784.3	519.3	386.7
60	80620	8053	4021	1603	1142	795.7	526.9	392.3
61	81770	8167	4079	1625	1158	807.2	534.4	398.0
62	82920	8282	4136	1648	1174	818.5	542.0	403.7
63	84060	8397	4193	1671	1191	829.9	549.6	409.3
64	85210	8511	4250	1694	1207	841.3	557.1	415.0
65	86350	8625	4308	1717	1223	852.7	564.7	420.6
66	87490	8740	4365	1740	1240	864.0	572.2	426.3
67	88630	8854	4422	1762	1256	875.4	579.8	431.9
68	89770	8968	4479	1785	1272	886.7	587.3	437.5
69	90910	9082	4535	1808	1288	898.0	594.8	443.1
70	92050	9195	4592	1831	1304	909.3	602.3	448.8
71	93190	9309	4649	1853	1321	920.7	609.9	454.4
72	94330	9423	4706	1876	1337	932.0	617.4	460.0
73	95460	9536	4763	1899	1353	943.2	624.9	465.6
74	96600	9650	4819	1921	1369	954.5	632.4	471.2
75	97730	9763	4876	1944	1385	965.8	639.9	476.8
76	98860	9876	4933	1966	1401	977.1	647.3	482.4
77	100000	9989	4989	1989	1417	988.3	654.8	488.0
78	101200	10110	5046	2011	1434	999.6	662.3	493.6
79	102300	10220	5102	2034	1450	1011	669.8	499.2
80	103400	10330	5158	2057	1466	1022	677.2	504.7
81	104600	10450	5215	2079	1482	1034	684.7	510.3
82	105700	10560	5271	2102	1498	1045	692.1	515.9
83	106800	10670	5328	2124	1514	1056	699.6	521.5
84	107900	10780	5384	2147	1530	1067	707.0	527.0
85	109100	10900	5440	2169	1546	1079	714.5	532.6
86	110200	11010	5496	2191	1562	1090	721.9	538.1
87	111300	11120	5552	2214	1578	1101	729.3	543.7
88	112400	11230	5608	2236	1594	1112	736.8	549.3
89	113600	11350	5665	2259	1610	1123	744.2	554.8
90	114700	11460	5721	2281	1626	1134	751.6	560.4
91	115800	11570	5777	2303	1642	1146	759.0	565.9
92	116900	11680	5833	2326	1658	1157	766.4	571.4
93	118100	11790	5889	2348	1674	1168	773.8	577.0
94	119200	11910	5945	2370	1690	1179	781.2	582.5
95	120300	12020	6000	2393	1706	1190	788.6	588.0
96	121400	12130	6056	2415	1721	1201	796.0	593.6
97	122500	12240	6112	2437	1737	1212	803.4	599.1
98	123600	12350	6168	2460	1753	1223	810.8	604.6
99	124800	12460	6224	2482	1769	1235	818.2	610.1
100	125900	12580	6279	2504	1785	1246	825.6	615.7

	100p						
c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
51	341.1	270.7	223.8	190.2	164.9	145.2	129.4
52	346.8	275.3	227.6	193.4	167.7	147.7	131.7
53	352.5	279.9	231.3	196.6	170.5	150.2	133.9
54	358.2	284.4	235.1	199.9	173.4	152.7	136.1
55	363.9	288.9	238.9	203.1	176.2	155.2	138.3
56	369.6	293.5	242.6	206.3	179.0	157.7	140.6
57	375.3	298.0	246.4	209.5	181.8	160.1	142.8
58	381.0	302.5	250.2	212.7	184.6	162.6	145.0
59	386.7	307.1	253.9	215.9	187.3	165.1	147.2
60	392.3	311.6	257.7	219.1	190.1	167.5	149.4
61	398.0	316.1	261.4	222.3	192.9	170.0	151.6
62	403.7	320.6	265.2	225.5	195.7	172.5	153.8
63	409.3	325.1	268.9	228.7	198.5	174.9	156.0
64	415.0	329.6	272.6	231.9	201.3	177.4	158.2
65	420.6	334.1	276.4	235.1	204.0	179.9	160.4
66	426.3	338.6	280.1	238.3	206.8	182.3	162.6
67	431.9	343.1	283.8	241.4	209.6	184.8	164.8
68	437.5	347.6	287.6	244.6	212.4	187.2	167.0
69	443.1	352.1	291.3	247.8	215.1	189.7	169.2
70	448.8	356.5	295.0	251.0	217.9	192.1	171.4
71	454.4	361.0	298.7	254.2	220.7	194.6	173.6
72	460.0	365.5	302.4	257.3	223.4	197.0	175.8
73	465.6	370.0	306.1	260.5	226.2	199.5	178.0
74	471.2	374.4	309.9	263.7	229.0	201.9	180.2
75	476.8	378.9	313.6	266.8	231.7	204.4	182.4
76	482.4	383.4	317.3	270.0	234.5	206.8	184.6
77	488.0	387.8	321.0	273.2	237.2	209.2	186.8
78	493.6	392.3	324.7	276.3	240.0	211.7	189.0
79	499.2	396.7	328.4	279.5	242.7	214.1	191.1
80	504.7	401.2	332.1	282.6	245.5	216.6	193.3
81	510.3	405.6	335.8	285.8	248.2	219.0	195.5
82	515.9	410.1	339.4	288.9	251.0	221.4	197.7
83	521.5	414.5	343.1	292.1	253.7	223.9	199.9
84	527.0	418.9	346.8	295.2	256.5	226.3	202.1
85	532.6	423.4	350.5	298.4	259.2	228.7	204.2
86	538.1	427.8	354.2	301.5	262.0	231.1	206.4
87	543.7	432.2	357.9	304.7	264.7	233.6	208.6
88	549.3	436.7	361.5	307.8	267.5	236.0	210.8
89	554.8	441.1	365.2	311.0	270.2	238.4	212.9
90	560.4	445.5	368.9	314.1	272.9	240.8	215.1
91	565.9	449.9	372.6	317.2	275.7	243.3	217.3
92	571.4	454.4	376.2	320.4	278.4	245.7	219.5
93	577.0	458.8	379.9	323.5	281.1	248.1	221.6
94	582.5	463.2	383.6	326.6	283.9	250.5	223.8
95	588.0	467.6	387.2	329.8	286.6	252.9	226.0
96	593.6	472.0	390.9	332.9	289.3	255.4	228.1
97	599.1	476.4	394.6	336.0	292.1	257.8	230.3
98	604.6	480.8	398.2	339.2	294.8	260.2	232.5
99	610.1	485.2	401.9	342.3	297.5	262.6	234.6
100	615.7	489.6	405.5	345.4	300.2	265.0	236.8

Table of n satisfying the equation $B(c,n,p) = 0.025$

c	100p = 0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
0	3688	367.1	182.6	71.92	50.84	35.02	22.70	16.54
1	5570	554.9	276.3	109.2	77.29	53.39	34.80	25.49
2	7223	719.9	358.7	141.9	100.6	69.59	45.48	33.41
3	8765	873.9	435.5	172.5	122.4	84.74	55.48	40.84
4	10240	1022	509.0	201.7	143.2	99.24	65.07	47.96
5	11670	1164	580.1	230.0	163.4	113.3	74.36	54.87
6	13060	1303	649.5	257.7	183.0	127.0	83.43	61.62
7	14420	1439	717.5	284.8	202.3	140.5	92.33	68.24
8	15760	1573	784.3	311.4	221.3	153.7	101.1	74.77
9	17090	1705	850.2	337.7	240.0	166.8	109.8	81.21
10	18390	1835	915.4	363.6	258.5	179.7	118.3	87.57
11	19680	1964	979.8	389.3	276.8	192.4	126.8	93.88
12	20960	2092	1044	414.8	295.0	205.1	135.2	100.2
13	22230	2219	1107	440.0	312.9	217.6	143.5	106.4
14	23490	2345	1170	465.0	330.8	230.1	151.7	112.5
15	24740	2470	1233	489.9	348.5	242.5	160.0	118.7
16	25980	2594	1295	514.7	366.2	254.8	168.1	124.7
17	27220	2717	1356	539.3	383.7	267.0	176.2	130.8
18	28450	2840	1418	563.7	401.1	279.2	184.3	136.8
19	29670	2962	1479	588.1	418.5	291.3	192.3	142.8
20	30890	3084	1539	612.3	435.8	303.4	200.3	148.8
21	32100	3205	1600	636.5	453.0	315.4	208.3	154.7
22	33310	3326	1660	660.5	470.1	327.4	216.3	160.7
23	34510	3446	1720	684.5	487.2	339.3	224.2	166.6
24	35710	3566	1780	708.3	504.2	351.2	232.1	172.5
25	36900	3685	1840	732.1	521.2	363.0	239.9	178.3
26	38090	3804	1899	755.9	538.1	374.8	247.8	184.2
27	39280	3923	1959	779.5	555.0	386.6	255.6	190.0
28	40470	4041	2018	803.1	571.8	398.4	263.4	195.9
29	41650	4159	2077	826.6	588.6	410.1	271.2	201.7
30	42830	4277	2135	850.1	605.3	421.8	278.9	207.5
31	44000	4394	2194	873.5	622.0	433.4	286.7	213.2
32	45170	4511	2253	896.9	638.7	445.1	294.4	219.0
33	46340	4628	2311	920.2	655.3	456.7	302.1	224.8
34	47510	4745	2369	943.5	671.9	468.3	309.8	230.5
35	48670	4861	2427	966.7	688.5	479.8	317.5	236.3
36	49840	4977	2486	989.8	705.0	491.4	325.1	242.0
37	51000	5093	2543	1013	721.5	502.9	332.8	247.7
38	52160	5209	2601	1037	738.0	514.4	340.4	253.4
39	53310	5325	2659	1060	754.4	525.9	348.1	259.1
40	54470	5440	2717	1083	770.8	537.3	355.7	264.8
41	55620	5555	2774	1106	787.2	548.8	363.3	270.5
42	56770	5670	2832	1128	803.6	560.2	370.9	276.2
43	57920	5785	2889	1151	819.9	571.6	378.5	281.8
44	59070	5900	2946	1174	836.2	583.0	386.0	287.5
45	60210	6014	3004	1197	852.5	594.4	393.6	293.1
46	61350	6129	3061	1220	868.8	605.8	401.1	298.8
47	62500	6243	3118	1243	885.0	617.1	408.7	304.4
48	63640	6357	3175	1265	901.3	628.5	416.2	310.0
49	64780	6471	3232	1288	917.5	639.8	423.7	315.7
50	65920	6584	3288	1311	933.7	651.1	431.3	321.3

Table of n satisfying the equation $B(c,n,p) = 0.025$

c	100p = 20.0	25.0	30.0	35.0	40.0	45.0	50.0
0	16.54	12.83	10.35	8.564	7.222	6.171	5.322
1	25.49	19.89	16.15	13.47	11.44	9.858	8.583
2	33.41	26.16	21.31	17.83	15.21	13.17	11.52
3	40.84	32.04	26.16	21.94	18.77	16.29	14.29
4	47.96	37.68	30.81	25.89	22.19	19.29	16.96
5	54.87	43.16	35.34	29.73	25.52	22.22	19.57
6	61.62	48.52	39.76	33.49	28.78	25.09	22.12
7	68.24	53.78	44.11	37.19	31.98	27.91	24.64
8	74.77	58.96	48.39	40.83	35.14	30.70	27.12
9	81.21	64.07	52.62	44.43	38.26	33.45	29.58
10	87.57	69.13	56.81	47.99	41.36	36.18	32.01
11	93.88	74.14	60.96	51.52	44.42	38.88	34.42
12	100.2	79.11	65.07	55.02	47.46	41.56	36.82
13	106.4	84.04	69.15	58.50	50.49	44.23	39.20
14	112.5	88.94	73.21	61.95	53.49	46.88	41.57
15	118.7	93.81	77.24	65.39	56.47	49.52	43.92
16	124.7	98.65	81.25	68.81	59.44	52.14	46.27
17	130.8	103.5	85.25	72.21	62.40	54.75	48.60
18	136.8	108.3	89.22	75.59	65.34	57.35	50.93
19	142.8	113.1	93.17	78.96	68.28	59.94	53.24
20	148.8	117.8	97.11	82.32	71.20	62.52	55.55
21	154.7	122.6	101.1	85.67	74.11	65.09	57.85
22	160.7	127.3	105.0	89.00	77.01	67.66	60.14
23	166.6	132.0	108.9	92.33	79.91	70.21	62.43
24	172.5	136.7	112.8	95.64	82.79	72.77	64.71
25	178.3	141.4	116.7	98.95	85.67	75.31	66.99
26	184.2	146.0	120.5	102.3	88.54	77.85	69.26
27	190.0	150.7	124.4	105.6	91.40	80.38	71.53
28	195.9	155.3	128.2	108.9	94.26	82.90	73.79
29	201.7	159.9	132.1	112.1	97.11	85.42	76.04
30	207.5	164.5	135.9	115.4	99.95	87.94	78.29
31	213.2	169.2	139.7	118.7	102.8	90.45	80.54
32	219.0	173.8	143.5	121.9	105.7	92.96	82.79
33	224.8	178.3	147.3	125.2	108.5	95.46	85.03
34	230.5	182.9	151.1	128.4	111.3	97.96	87.26
35	236.3	187.5	154.9	131.6	114.1	100.5	89.50
36	242.0	192.1	158.7	134.9	117.0	103.0	91.73
37	247.7	196.6	162.5	138.1	119.8	105.5	93.95
38	253.4	201.2	166.3	141.3	122.6	108.0	96.18
39	259.1	205.7	170.0	144.5	125.4	110.4	98.40
40	264.8	210.2	173.8	147.8	128.2	112.9	100.7
41	270.5	214.8	177.6	151.0	131.0	115.4	102.9
42	276.2	219.3	181.3	154.2	133.8	117.9	105.1
43	281.8	223.8	185.1	157.4	136.6	120.3	107.3
44	287.5	228.3	188.8	160.6	139.3	122.8	109.5
45	293.1	232.8	192.6	163.8	142.1	125.3	111.7
46	298.8	237.3	196.3	167.0	144.9	127.7	113.9
47	304.4	241.8	200.0	170.1	147.7	130.2	116.1
48	310.0	246.3	203.8	173.3	150.5	132.6	118.3
49	315.7	250.8	207.5	176.5	153.2	135.1	120.5
50	321.3	255.3	211.2	179.7	156.0	137.5	122.7

Table of n satisfying the equation B(c,n,p)= 0.025

100p

c	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
51	67050	6698	3345	1333	949.8	662.4	438.8	326.9
52	68190	6811	3402	1356	966.0	673.7	446.3	332.5
53	69320	6925	3459	1379	982.1	684.9	453.8	338.1
54	70460	7038	3515	1401	998.2	696.2	461.2	343.7
55	71590	7151	3572	1424	1015	707.5	468.7	349.3
56	72720	7264	3628	1446	1031	718.7	476.2	354.9
57	73850	7377	3685	1469	1047	729.9	483.7	360.5
58	74970	7490	3741	1491	1063	741.1	491.1	366.0
59	76100	7602	3797	1514	1079	752.4	498.6	371.6
60	77230	7715	3853	1536	1095	763.5	506.0	377.2
61	78350	7828	3910	1559	1111	774.7	513.4	382.7
62	79480	7940	3966	1581	1127	785.9	520.9	388.3
63	80600	8052	4022	1604	1143	797.1	528.3	393.8
64	81720	8164	4078	1626	1159	808.2	535.7	399.4
65	82840	8276	4134	1648	1175	819.4	543.1	404.9
66	83960	8388	4190	1671	1191	830.5	550.5	410.5
67	85080	8500	4246	1693	1207	841.7	557.9	416.0
68	86200	8612	4302	1715	1223	852.8	565.3	421.5
69	87320	8724	4357	1738	1239	863.9	572.7	427.0
70	88440	8835	4413	1760	1255	875.0	580.1	432.6
71	89550	8947	4469	1782	1270	886.1	587.5	438.1
72	90670	9058	4525	1804	1286	897.2	594.9	443.6
73	91780	9170	4580	1827	1302	908.3	602.2	449.1
74	92900	9281	4636	1849	1318	919.4	609.6	454.6
75	94010	9392	4692	1871	1334	930.4	616.9	460.1
76	95120	9503	4747	1893	1350	941.5	624.3	465.6
77	96230	9615	4803	1916	1366	952.6	631.7	471.1
78	97340	9726	4858	1938	1381	963.6	639.0	476.6
79	98450	9837	4914	1960	1397	974.7	646.3	482.1
80	99560	9947	4969	1982	1413	985.7	653.7	487.6
81	100700	10060	5024	2004	1429	996.7	661.0	493.1
82	101800	10170	5080	2026	1444	1008	668.4	498.6
83	102900	10280	5135	2048	1460	1019	675.7	504.1
84	104000	10390	5190	2070	1476	1030	683.0	509.5
85	105100	10510	5246	2092	1492	1041	690.3	515.0
86	106200	10620	5301	2114	1508	1052	697.6	520.5
87	107400	10730	5356	2137	1523	1063	704.9	525.9
88	108500	10840	5411	2159	1539	1074	712.3	531.4
89	109600	10950	5466	2181	1555	1085	719.6	536.9
90	110700	11060	5521	2203	1570	1096	726.9	542.3
91	111800	11170	5576	2225	1586	1107	734.2	547.8
92	112900	11280	5632	2247	1602	1118	741.4	553.3
93	114000	11390	5687	2269	1617	1129	748.7	558.7
94	115100	11500	5742	2291	1633	1140	756.0	564.2
95	116200	11610	5797	2312	1649	1151	763.3	569.6
96	117300	11720	5851	2334	1664	1162	770.6	575.1
97	118400	11830	5906	2356	1680	1173	777.9	580.5
98	119500	11940	5961	2378	1696	1184	785.1	585.9
99	120600	12050	6016	2400	1711	1195	792.4	591.4
100	121700	12160	6071	2422	1727	1206	799.7	596.8

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
51	326.9	259.7	214.9	182.8	158.8	140.0	124.9
52	332.5	264.2	218.6	186.0	161.5	142.4	127.1
53	338.1	268.7	222.3	189.2	164.3	144.9	129.3
54	343.7	273.1	226.0	192.3	167.0	147.3	131.5
55	349.3	277.6	229.7	195.5	169.8	149.7	133.7
56	354.9	282.0	233.4	198.7	172.5	152.2	135.9
57	360.5	286.5	237.1	201.8	175.3	154.6	138.0
58	366.0	290.9	240.8	205.0	178.0	157.1	140.2
59	371.6	295.4	244.5	208.1	180.8	159.5	142.4
60	377.2	299.8	248.2	211.3	183.5	161.9	144.6
61	382.7	304.2	251.9	214.4	186.3	164.3	146.8
62	388.3	308.7	255.5	217.6	189.0	166.8	148.9
63	393.8	313.1	259.2	220.7	191.8	169.2	151.1
64	399.4	317.5	262.9	223.8	194.5	171.6	153.3
65	404.9	321.9	266.6	227.0	197.2	174.0	155.4
66	410.5	326.4	270.2	230.1	200.0	176.5	157.6
67	416.0	330.8	273.9	233.2	202.7	178.9	159.8
68	421.5	335.2	277.6	236.4	205.4	181.3	162.0
69	427.0	339.6	281.2	239.5	208.1	183.7	164.1
70	432.6	344.0	284.9	242.6	210.9	186.1	166.3
71	438.1	348.4	288.5	245.7	213.6	188.5	168.4
72	443.6	352.8	292.2	248.9	216.3	191.0	170.6
73	449.1	357.2	295.9	252.0	219.0	193.4	172.8
74	454.6	361.6	299.5	255.1	221.8	195.8	174.9
75	460.1	366.0	303.2	258.2	224.5	198.2	177.1
76	465.6	370.4	306.8	261.3	227.2	200.6	179.3
77	471.1	374.8	310.4	264.5	229.9	203.0	181.4
78	476.6	379.1	314.1	267.6	232.6	205.4	183.6
79	482.1	383.5	317.7	270.7	235.3	207.8	185.7
80	487.6	387.9	321.4	273.8	238.1	210.2	187.9
81	493.1	392.3	325.0	276.9	240.8	212.6	190.0
82	498.6	396.6	328.6	280.0	243.5	215.0	192.2
83	504.1	401.0	332.3	283.1	246.2	217.4	194.3
84	509.5	405.4	335.9	286.2	248.9	219.8	196.5
85	515.0	409.8	339.5	289.3	251.6	222.2	198.6
86	520.5	414.1	343.2	292.4	254.3	224.6	200.8
87	525.9	418.5	346.8	295.5	257.0	227.0	202.9
88	531.4	422.8	350.4	298.6	259.7	229.4	205.1
89	536.9	427.2	354.0	301.7	262.4	231.8	207.2
90	542.3	431.6	357.7	304.8	265.1	234.2	209.4
91	547.8	435.9	361.3	307.9	267.8	236.6	211.5
92	553.3	440.3	364.9	311.0	270.5	239.0	213.7
93	558.7	444.6	368.5	314.1	273.2	241.3	215.8
94	564.2	449.0	372.1	317.2	275.9	243.7	218.0
95	569.6	453.3	375.7	320.3	278.6	246.1	220.1
96	575.1	457.7	379.3	323.3	281.3	248.5	222.2
97	580.5	462.0	383.0	326.4	284.0	250.9	224.4
98	585.9	466.4	386.6	329.5	286.7	253.3	226.5
99	591.4	470.7	390.2	332.6	289.4	255.7	228.7
100	596.8	475.0	393.8	335.7	292.0	258.0	230.8

Table of n satisfying the equation B(c,n,p)= 0.050

	100p							
c	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
0	2995	298.1	148.3	58.41	41.29	29.44	18.44	13.43
1	4742	472.6	235.4	92.99	65.88	45.54	29.71	21.78
2	6294	627.5	312.7	123.8	87.77	60.77	39.77	29.25
3	7752	773.0	385.3	152.7	108.4	75.12	49.25	36.30
4	9151	912.8	455.1	180.5	128.2	88.91	58.37	43.09
5	10520	1049	522.9	207.5	147.4	102.4	67.25	49.70
6	11840	1182	589.2	233.9	166.3	115.5	75.94	56.17
7	13150	1312	654.4	259.9	184.8	128.4	84.49	62.54
8	14440	1441	718.6	285.5	203.0	141.1	92.91	68.82
9	15710	1568	781.9	310.8	221.0	153.7	101.3	75.03
10	16960	1693	844.7	335.8	238.8	166.1	109.5	81.18
11	18210	1818	906.8	360.6	256.5	178.4	117.7	87.28
12	19440	1941	968.4	385.1	274.0	190.7	125.8	93.33
13	20670	2064	1030	409.5	291.4	202.8	133.9	99.34
14	21890	2185	1091	433.8	308.7	214.9	141.9	105.4
15	23100	2306	1151	457.9	325.9	226.9	149.8	111.3
16	24300	2426	1211	481.9	343.0	238.8	157.8	117.2
17	25500	2546	1271	505.7	360.0	250.7	165.7	123.1
18	26690	2665	1331	529.5	376.9	262.5	173.5	129.0
19	27880	2784	1390	553.1	393.8	274.3	181.3	134.8
20	29060	2902	1449	576.7	410.6	286.0	189.1	140.6
21	30240	3020	1508	600.2	427.4	297.7	196.9	146.4
22	31420	3137	1567	623.6	444.1	309.4	204.6	152.2
23	32590	3254	1625	646.9	460.7	321.0	212.3	158.0
24	33750	3371	1683	670.2	477.3	332.6	220.0	163.7
25	34920	3487	1741	693.4	493.8	344.1	227.7	169.4
26	36080	3603	1799	716.5	510.3	355.7	235.3	175.2
27	37230	3719	1857	739.6	526.8	367.2	243.0	180.9
28	38390	3834	1915	762.6	543.2	378.6	250.6	186.6
29	39540	3949	1972	785.5	559.6	390.1	258.2	192.2
30	40690	4064	2030	808.5	575.9	401.5	265.8	197.9
31	41840	4179	2087	831.3	592.2	412.9	273.4	203.6
32	42980	4293	2144	854.1	608.5	424.3	280.9	209.2
33	44120	4407	2201	876.9	624.8	435.6	288.5	214.8
34	45260	4521	2258	899.7	641.0	446.9	296.0	220.5
35	46400	4635	2315	922.4	657.2	458.3	303.5	226.1
36	47540	4749	2372	945.0	673.3	469.6	311.0	231.7
37	48670	4862	2428	967.7	689.5	480.8	318.5	237.3
38	49810	4975	2485	990.2	705.6	492.1	326.0	242.9
39	50940	5088	2541	1013	721.7	503.3	333.5	248.5
40	52070	5201	2598	1036	737.8	514.6	340.9	254.1
41	53200	5314	2654	1058	753.8	525.8	348.4	259.6
42	54320	5427	2711	1081	769.8	537.0	355.8	265.2
43	55450	5539	2767	1103	785.9	548.2	363.3	270.8
44	56570	5651	2823	1126	801.8	559.3	370.7	276.3
45	57690	5764	2879	1148	817.8	570.5	378.1	281.9
46	58810	5876	2935	1170	833.8	581.7	385.5	287.4
47	59930	5988	2991	1193	849.7	592.8	392.9	292.9
48	61050	6099	3047	1215	865.6	603.9	400.3	298.5
49	62170	6211	3102	1237	881.5	615.0	407.7	304.0
50	63290	6323	3158	1260	897.4	626.1	415.1	309.5

	100p						
c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
0	13.43	10.42	8.400	6.955	5.865	5.011	4.322
1	21.78	17.01	13.83	11.55	9.822	8.476	7.391
2	29.25	22.93	18.70	15.68	13.40	11.62	10.18
3	36.30	28.52	23.32	19.59	16.79	14.60	12.83
4	43.09	33.90	27.77	23.37	20.06	17.48	15.40
5	49.70	39.15	32.10	27.06	23.26	20.30	17.91
6	56.17	44.29	36.36	30.68	26.40	23.06	20.38
7	62.54	49.35	40.54	34.24	29.49	25.79	22.81
8	68.82	54.34	44.68	37.76	32.55	28.49	25.22
9	75.03	59.28	48.76	41.24	35.57	31.15	27.60
10	81.18	64.17	52.81	44.69	38.57	33.80	29.97
11	87.28	69.02	56.83	48.11	41.55	36.43	32.31
12	93.33	73.84	60.82	51.51	44.50	39.04	34.65
13	99.34	78.62	64.79	54.89	47.44	41.63	36.97
14	105.4	83.37	68.73	58.25	50.36	44.22	39.28
15	111.3	88.10	72.65	61.59	53.27	46.78	41.57
16	117.2	92.81	76.55	64.92	56.17	49.34	43.86
17	123.1	97.50	80.44	68.23	59.05	51.89	46.14
18	129.0	102.2	84.31	71.53	61.92	54.43	48.42
19	134.8	106.9	88.16	74.82	64.79	56.96	50.68
20	140.6	111.5	92.01	78.10	67.64	59.49	52.94
21	146.4	116.1	95.84	81.37	70.49	62.00	55.19
22	152.2	120.7	99.66	84.62	73.33	64.51	57.44
23	158.0	125.3	103.5	87.87	76.16	67.02	59.68
24	163.7	129.9	107.3	91.12	78.98	69.52	61.92
25	169.4	134.5	111.1	94.35	81.80	72.01	64.15
26	175.2	139.0	114.9	97.58	84.61	74.49	66.38
27	180.9	143.6	118.7	100.8	87.41	76.98	68.60
28	186.6	148.1	122.4	104.1	90.21	79.45	70.82
29	192.2	152.6	126.2	107.3	93.01	81.93	73.03
30	197.9	157.1	129.9	110.5	95.80	84.40	75.25
31	203.6	161.6	133.7	113.7	98.58	86.86	77.45
32	209.2	166.1	137.4	116.9	101.4	89.32	79.66
33	214.8	170.6	141.1	120.0	104.2	91.78	81.86
34	220.5	175.1	144.9	123.2	107.0	94.23	84.06
35	226.1	179.6	148.6	126.4	109.7	96.68	86.26
36	231.7	184.1	152.3	129.6	112.5	99.13	88.45
37	237.3	188.5	156.0	132.7	115.3	101.6	90.64
38	242.9	193.0	159.7	135.9	118.0	104.1	92.83
39	248.5	197.5	163.4	139.1	120.8	106.5	95.01
40	254.1	201.9	167.1	142.2	123.5	108.9	97.20
41	259.6	206.4	170.8	145.4	126.3	111.4	99.38
42	265.2	210.8	174.5	148.5	129.0	113.8	101.6
43	270.8	215.2	178.2	151.7	131.7	116.2	103.8
44	276.3	219.7	181.8	154.8	134.5	118.7	106.0
45	281.9	224.1	185.5	157.9	137.2	121.1	108.1
46	287.4	228.5	189.2	161.1	140.0	123.5	110.3
47	292.9	232.9	192.9	164.2	142.7	125.9	112.5
48	298.5	237.3	196.5	167.3	145.4	128.3	114.6
49	304.0	241.7	200.2	170.5	148.1	130.8	116.8
50	309.5	246.1	203.8	173.6	150.9	133.2	119.0

Table of n satisfying the equation B(c,n,p)= 0.050

100p

c	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
51	64400	6434	3214	1282	913.3	637.2	422.5	315.0
52	65510	6545	3269	1304	929.1	648.3	429.8	320.5
53	66630	6657	3325	1326	945.0	659.4	437.2	326.0
54	67740	6768	3381	1348	960.8	670.4	444.5	331.5
55	68850	6879	3436	1371	976.6	681.5	451.9	337.0
56	69960	6990	3492	1393	992.4	692.5	459.2	342.5
57	71070	7100	3547	1415	1009	703.5	466.6	348.0
58	72170	7211	3602	1437	1024	714.6	473.9	353.5
59	73280	7322	3658	1459	1040	725.6	481.2	359.0
60	74390	7432	3713	1481	1056	736.6	488.5	364.4
61	75490	7543	3768	1503	1072	747.6	495.8	369.9
62	76600	7653	3823	1525	1087	758.6	503.1	375.4
63	77700	7763	3878	1547	1103	769.5	510.4	380.8
64	78800	7874	3933	1569	1119	780.5	517.7	386.3
65	79900	7984	3988	1591	1134	791.5	525.0	391.8
66	81010	8094	4043	1613	1150	802.4	532.3	397.2
67	82110	8204	4098	1635	1166	813.4	539.6	402.7
68	83210	8314	4153	1657	1181	824.3	546.9	408.1
69	84300	8423	4208	1679	1197	835.3	554.2	413.5
70	85400	8533	4263	1701	1213	846.2	561.4	419.0
71	86500	8643	4318	1723	1228	857.1	568.7	424.4
72	87600	8753	4373	1745	1244	868.1	576.0	429.9
73	88690	8862	4427	1766	1260	879.0	583.2	435.3
74	89790	8972	4482	1788	1275	889.9	590.5	440.7
75	90880	9081	4537	1810	1291	900.8	597.7	446.1
76	91980	9190	4591	1832	1306	911.7	605.0	451.6
77	93070	9300	4646	1854	1322	922.6	612.2	457.0
78	94160	9409	4701	1876	1338	933.4	619.4	462.4
79	95260	9518	4755	1897	1353	944.3	626.7	467.8
80	96350	9627	4810	1919	1369	955.2	633.9	473.2
81	97440	9736	4864	1941	1384	966.0	641.1	478.6
82	98530	9845	4919	1963	1400	976.9	648.4	484.0
83	99620	9954	4973	1985	1415	987.8	655.6	489.4
84	100800	10070	5028	2006	1431	998.6	662.8	494.8
85	101800	10180	5082	2028	1446	1010	670.0	500.2
86	102900	10290	5136	2050	1462	1021	677.2	505.6
87	104000	10390	5191	2071	1477	1032	684.4	511.0
88	105100	10500	5245	2093	1493	1042	691.6	516.4
89	106200	10610	5299	2115	1508	1053	698.8	521.8
90	107300	10720	5354	2137	1524	1064	706.0	527.2
91	108400	10830	5408	2158	1539	1075	713.2	532.6
92	109500	10940	5462	2180	1555	1086	720.4	538.0
93	110500	11050	5516	2202	1570	1096	727.6	543.3
94	111600	11150	5571	2223	1586	1107	734.8	548.7
95	112700	11260	5625	2245	1601	1118	742.0	554.1
96	113800	11370	5679	2266	1616	1129	749.2	559.5
97	114900	11480	5733	2288	1632	1140	756.3	564.8
98	116000	11590	5787	2310	1647	1150	763.5	570.2
99	117000	11700	5841	2331	1663	1161	770.7	575.6
100	118100	11800	5895	2353	1678	1172	777.9	580.9

Table of n satisfying the equation B(c,n,p)= 0.050

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
51	315.0	250.5	207.5	176.7	153.6	135.6	121.1
52	320.5	254.9	211.1	179.8	156.3	138.0	123.3
53	326.0	259.3	214.8	182.9	159.0	140.4	125.4
54	331.5	263.7	218.4	186.1	161.8	142.8	127.6
55	337.0	268.1	222.1	189.2	164.5	145.2	129.8
56	342.5	272.5	225.7	192.3	167.2	147.6	131.9
57	348.0	276.8	229.4	195.4	169.9	150.0	134.1
58	353.5	281.2	233.0	198.5	172.6	152.4	136.2
59	359.0	285.6	236.6	201.6	175.3	154.8	138.4
60	364.4	289.9	240.2	204.7	178.0	157.2	140.5
61	369.9	294.3	243.9	207.8	180.7	159.6	142.7
62	375.4	298.7	247.5	210.9	183.4	162.0	144.8
63	380.8	303.0	251.1	214.0	186.1	164.4	147.0
64	386.3	307.4	254.7	217.1	188.8	166.8	149.1
65	391.8	311.7	258.4	220.2	191.5	169.2	151.3
66	397.2	316.1	262.0	223.3	194.2	171.6	153.4
67	402.7	320.4	265.6	226.4	196.9	173.9	155.5
68	408.1	324.8	269.2	229.4	199.6	176.3	157.7
69	413.5	329.1	272.8	232.5	202.3	178.7	159.8
70	419.0	333.5	276.4	235.6	205.0	181.1	162.0
71	424.4	337.8	280.0	238.7	207.7	183.5	164.1
72	429.9	342.1	283.6	241.8	210.4	185.9	166.2
73	435.3	346.5	287.2	244.9	213.0	188.2	168.4
74	440.7	350.8	290.8	247.9	215.7	190.6	170.5
75	446.1	355.1	294.4	251.0	218.4	193.0	172.6
76	451.6	359.5	298.0	254.1	221.1	195.4	174.8
77	457.0	363.8	301.6	257.2	223.8	197.8	176.9
78	462.4	368.1	305.2	260.2	226.4	200.1	179.0
79	467.8	372.4	308.8	263.3	229.1	202.5	181.2
80	473.2	376.7	312.4	266.4	231.8	204.9	183.3
81	478.6	381.1	316.0	269.4	234.5	207.3	185.4
82	484.0	385.4	319.6	272.5	237.2	209.6	187.6
83	489.4	389.7	323.1	275.6	239.8	212.0	189.7
84	494.8	394.0	326.7	278.6	242.5	214.4	191.8
85	500.2	398.3	330.3	281.7	245.2	216.7	193.9
86	505.6	402.6	333.9	284.7	247.9	219.1	196.1
87	511.0	406.9	337.5	287.8	250.5	221.5	198.2
88	516.4	411.2	341.0	290.9	253.2	223.8	200.3
89	521.8	415.5	344.6	293.9	255.9	226.2	202.4
90	527.2	419.8	348.2	297.0	258.5	228.6	204.6
91	532.6	424.1	351.8	300.0	261.2	230.9	206.7
92	538.0	428.4	355.3	303.1	263.9	233.3	208.8
93	543.3	432.7	358.9	306.1	266.5	235.7	210.9
94	548.7	437.0	362.5	309.2	269.2	238.0	213.0
95	554.1	441.3	366.0	312.2	271.9	240.4	215.2
96	559.5	445.6	369.6	315.3	274.5	242.7	217.3
97	564.8	449.9	373.2	318.3	277.2	245.1	219.4
98	570.2	454.2	376.7	321.4	279.8	247.5	221.5
99	575.6	458.4	380.3	324.4	282.5	249.8	223.6
100	580.9	462.7	383.9	327.5	285.2	252.2	225.7

Table of n satisfying the equation B(c,n,p)= 0.100

	100p						
c	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
0	2302	229.2	114.0	44.90	31.73	21.86	14.17	10.32
1	3889	387.6	193.1	76.34	54.11	37.43	24.45	17.95
2	5321	530.6	264.5	104.8	74.36	51.54	33.78	24.89
3	6679	666.3	332.2	131.8	93.58	64.94	42.65	31.49
4	7992	797.4	397.7	157.9	112.2	77.90	51.24	37.89
5	9273	925.4	461.6	183.4	130.4	90.57	59.63	44.15
6	10530	1051	524.4	208.4	148.2	103.1	67.88	50.30
7	11770	1175	586.2	233.1	165.8	115.3	76.02	56.37
8	13000	1297	647.3	257.4	183.2	127.4	84.06	62.37
9	14210	1418	707.7	281.5	200.4	139.5	92.02	68.32
10	15410	1538	767.7	305.5	217.4	151.4	99.92	74.21
11	16600	1658	827.1	329.2	234.3	163.2	107.8	80.07
12	17780	1776	886.2	352.8	251.1	174.9	115.6	85.89
13	18960	1893	945.0	376.2	267.9	186.6	123.4	91.68
14	20130	2010	1004	399.5	284.5	198.2	131.1	97.44
15	21290	2127	1062	422.7	301.0	209.8	138.7	103.2
16	22450	2242	1120	445.8	317.5	221.3	146.4	108.9
17	23610	2358	1177	468.8	333.9	232.7	154.0	114.6
18	24760	2473	1235	491.8	350.3	244.2	161.6	120.3
19	25900	2587	1292	514.6	366.6	255.5	169.2	125.9
20	27050	2701	1349	537.4	382.8	266.9	176.7	131.6
21	28190	2815	1406	560.1	399.0	278.2	184.2	137.2
22	29320	2929	1463	582.8	415.2	289.5	191.7	142.8
23	30450	3042	1519	605.3	431.3	300.8	199.2	148.4
24	31580	3155	1576	627.9	447.4	312.0	206.7	154.0
25	32710	3268	1632	650.4	463.4	323.2	214.1	159.6
26	33840	3380	1688	672.8	479.4	334.4	221.6	165.1
27	34960	3492	1744	695.2	495.4	345.6	229.0	170.7
28	36080	3604	1800	717.6	511.4	356.7	236.4	176.2
29	37200	3716	1856	739.9	527.3	367.8	243.8	181.7
30	38320	3828	1912	762.1	543.2	378.9	251.2	187.3
31	39430	3939	1968	784.4	559.1	390.0	258.6	192.8
32	40540	4050	2023	806.6	574.9	401.1	265.9	198.3
33	41650	4162	2079	828.8	590.7	412.2	273.3	203.8
34	42760	4272	2134	850.9	606.5	423.2	280.6	209.3
35	43870	4383	2190	873.0	622.3	434.2	287.9	214.8
36	44980	4494	2245	895.1	638.0	445.2	295.3	220.2
37	46080	4604	2300	917.1	653.8	456.2	302.6	225.7
38	47190	4715	2355	939.1	669.5	467.2	309.9	231.2
39	48290	4825	2410	961.1	685.2	478.2	317.2	236.6
40	49390	4935	2465	983.1	700.9	489.1	324.5	242.1
41	50490	5045	2520	1006	716.5	500.1	331.7	247.5
42	51590	5155	2575	1027	732.2	511.0	339.0	253.0
43	52690	5264	2630	1049	747.8	522.0	346.3	258.4
44	53780	5374	2685	1071	763.4	532.9	353.5	263.8
45	54880	5483	2739	1093	779.0	543.8	360.8	269.3
46	55970	5593	2794	1115	794.6	554.7	368.0	274.7
47	57070	5702	2849	1137	810.2	565.6	375.3	280.1
48	58160	5811	2903	1159	825.7	576.4	382.5	285.5
49	59250	5920	2958	1180	841.3	587.3	389.7	290.9
50	60340	6029	3012	1202	856.8	598.2	397.0	296.3

c	100p 20.0	25.0	30.0	35.0	40.0	45.0	50.0
0	10.32	8.004	6.456	5.346	4.508	3.852	3.322
1	17.95	14.05	11.44	9.562	8.153	7.051	6.163
2	24.89	19.55	15.98	13.42	11.50	9.990	8.779
3	31.49	24.79	20.31	17.11	14.69	12.81	11.29
4	37.89	29.88	24.52	20.69	17.80	15.55	13.74
5	44.15	34.85	28.64	24.19	20.85	18.24	16.14
6	50.30	39.74	32.69	27.64	23.85	20.88	18.50
7	56.37	44.57	36.69	31.05	26.81	23.50	20.84
8	62.37	49.34	40.65	34.42	29.74	26.09	23.16
9	68.32	54.08	44.57	37.77	32.65	28.66	25.46
10	74.21	58.77	48.46	41.09	35.54	31.22	27.74
11	80.07	63.44	52.33	44.39	38.41	33.75	30.01
12	85.89	68.07	56.18	47.67	41.27	36.28	32.27
13	91.68	72.68	60.00	50.93	44.11	38.79	34.52
14	97.44	77.27	63.81	54.18	46.94	41.30	36.76
15	103.2	81.84	67.60	57.42	49.76	43.79	39.00
16	108.9	86.39	71.38	60.64	52.57	46.27	41.22
17	114.6	90.93	75.14	63.85	55.37	48.75	43.44
18	120.3	95.45	78.90	67.06	58.16	51.22	45.65
19	125.9	99.96	82.64	70.25	60.94	53.68	47.86
20	131.6	104.5	86.37	73.44	63.72	56.14	50.06
21	137.2	109.0	90.09	76.61	66.49	58.59	52.26
22	142.8	113.4	93.80	79.78	69.25	61.04	54.45
23	148.4	117.9	97.51	82.95	72.01	63.48	56.64
24	154.0	122.4	101.2	86.10	74.76	65.92	58.83
25	159.6	126.8	104.9	89.26	77.51	68.35	61.01
26	165.1	131.2	108.6	92.40	80.25	70.78	63.18
27	170.7	135.7	112.3	95.54	82.99	73.21	65.36
28	176.2	140.1	116.0	98.68	85.72	75.63	67.53
29	181.7	144.5	119.6	101.9	88.45	78.04	69.70
30	187.3	148.9	123.3	105.0	91.18	80.46	71.86
31	192.8	153.3	126.9	108.1	93.90	82.87	74.02
32	198.3	157.7	130.6	111.2	96.62	85.28	76.18
33	203.8	162.1	134.2	114.3	99.33	87.68	78.34
34	209.3	166.4	137.9	117.4	102.1	90.09	80.50
35	214.8	170.8	141.5	120.5	104.8	92.49	82.65
36	220.2	175.2	145.1	123.6	107.5	94.88	84.80
37	225.7	179.6	148.8	126.7	110.2	97.28	86.95
38	231.2	183.9	152.4	129.8	112.9	99.67	89.09
39	236.6	188.3	156.0	132.9	115.6	102.1	91.24
40	242.1	192.6	159.6	136.0	118.3	104.5	93.38
41	247.5	197.0	163.2	139.1	121.0	106.9	95.52
42	253.0	201.3	166.8	142.2	123.7	109.3	97.66
43	258.4	205.6	170.4	145.3	126.4	111.7	99.80
44	263.8	210.0	174.0	148.4	129.1	114.0	102.0
45	269.3	214.3	177.6	151.4	131.8	116.4	104.1
46	274.7	218.6	181.2	154.5	134.4	118.8	106.3
47	280.1	223.0	184.8	157.6	137.1	121.2	108.4
48	285.5	227.3	188.4	160.7	139.8	123.5	110.5
49	290.9	231.6	192.0	163.7	142.5	125.9	112.6
50	296.3	235.9	195.6	166.8	145.1	128.3	114.8

Table of n satisfying the equation B(c,n,p)= 0.100

100p

c	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
51	61430	6138	3067	1224	872.3	609.0	404.2	301.7
52	62520	6247	3121	1246	887.8	619.8	411.4	307.1
53	63610	6356	3175	1267	903.3	630.7	418.6	312.5
54	64690	6464	3230	1289	918.8	641.5	425.8	317.9
55	65780	6573	3284	1311	934.3	652.3	433.0	323.3
56	66860	6681	3338	1332	949.7	663.1	440.2	328.7
57	67950	6790	3392	1354	965.2	673.9	447.4	334.0
58	69030	6898	3447	1376	980.6	684.7	454.6	339.4
59	70120	7007	3501	1397	996.1	695.5	461.7	344.8
60	71200	7115	3555	1419	1012	706.3	468.9	350.2
61	72280	7223	3609	1440	1027	717.1	476.1	355.5
62	73360	7331	3663	1462	1043	727.9	483.2	360.9
63	74440	7439	3717	1484	1058	738.6	490.4	366.3
64	75520	7547	3771	1505	1074	749.4	497.6	371.6
65	76600	7655	3825	1527	1089	760.1	504.7	377.0
66	77680	7763	3879	1548	1104	770.9	511.9	382.3
67	78760	7870	3933	1570	1120	781.6	519.0	387.7
68	79840	7978	3986	1591	1135	792.4	526.2	393.0
69	80910	8086	4040	1613	1150	803.1	533.3	398.4
70	81990	8193	4094	1634	1166	813.8	540.4	403.7
71	83060	8301	4148	1656	1181	824.5	547.6	409.0
72	84140	8409	4201	1677	1196	835.2	554.7	414.4
73	85220	8516	4255	1699	1212	846.0	561.8	419.7
74	86290	8623	4309	1720	1227	856.7	568.9	425.0
75	87360	8731	4363	1742	1242	867.4	576.1	430.4
76	88440	8838	4416	1763	1258	878.1	583.2	435.7
77	89510	8945	4470	1784	1273	888.8	590.3	441.0
78	90580	9053	4523	1806	1288	899.4	597.4	446.4
79	91650	9160	4577	1827	1303	910.1	604.5	451.7
80	92730	9267	4630	1849	1319	920.8	611.6	457.0
81	93800	9374	4684	1870	1334	931.5	618.7	462.3
82	94870	9481	4737	1891	1349	942.1	625.8	467.6
83	95940	9588	4791	1913	1364	952.8	632.9	472.9
84	97010	9695	4844	1934	1380	963.5	640.0	478.3
85	98080	9802	4898	1955	1395	974.1	647.1	483.6
86	99150	9909	4951	1977	1410	984.8	654.2	488.9
87	100300	10020	5005	1998	1425	995.4	661.3	494.2
88	101300	10130	5058	2019	1441	1007	668.4	499.5
89	102400	10230	5111	2041	1456	1017	675.5	504.8
90	103500	10340	5165	2062	1471	1028	682.6	510.1
91	104500	10450	5218	2083	1486	1038	689.6	515.4
92	105600	10550	5271	2105	1502	1049	696.7	520.7
93	106700	10660	5325	2126	1517	1060	703.8	526.0
94	107700	10770	5378	2147	1532	1070	710.9	531.3
95	108800	10870	5431	2169	1547	1081	717.9	536.6
96	109900	10980	5484	2190	1562	1092	725.0	541.9
97	110900	11090	5538	2211	1577	1102	732.1	547.2
98	112000	11190	5591	2232	1593	1113	739.1	552.5
99	113100	11300	5644	2254	1608	1123	746.2	557.7
100	114100	11410	5697	2275	1623	1134	753.2	563.0

Table of n satisfying the equation B(c,n,p)= 0.100

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
51	301.7	240.2	199.2	169.8	147.8	130.7	116.9
52	307.1	244.5	202.8	172.9	150.5	133.0	119.0
53	312.5	248.8	206.3	176.0	153.2	135.4	121.1
54	317.9	253.1	209.9	179.0	155.8	137.8	123.3
55	323.3	257.4	213.5	182.1	158.5	140.1	125.4
56	328.7	261.7	217.1	185.1	161.2	142.5	127.5
57	334.0	266.0	220.6	188.2	163.8	144.8	129.6
58	339.4	270.3	224.2	191.2	166.5	147.2	131.8
59	344.8	274.6	227.8	194.3	169.1	149.6	133.9
60	350.2	278.9	231.3	197.3	171.8	151.9	136.0
61	355.5	283.2	234.9	200.4	174.5	154.3	138.1
62	360.9	287.5	238.5	203.4	177.1	156.6	140.2
63	366.3	291.7	242.0	206.5	179.8	159.0	142.3
64	371.6	296.0	245.6	209.5	182.4	161.3	144.4
65	377.0	300.3	249.1	212.6	185.1	163.7	146.6
66	382.3	304.6	252.7	215.6	187.7	166.1	148.7
67	387.7	308.8	256.2	218.6	190.4	168.4	150.8
68	393.0	313.1	259.8	221.7	193.0	170.8	152.9
69	398.4	317.4	263.3	224.7	195.7	173.1	155.0
70	403.7	321.6	266.9	227.7	198.3	175.5	157.1
71	409.0	325.9	270.4	230.8	201.0	177.8	159.2
72	414.4	330.2	274.0	233.8	203.6	180.1	161.3
73	419.7	334.4	277.5	236.8	206.3	182.5	163.4
74	425.0	338.7	281.0	239.9	208.9	184.8	165.5
75	430.4	342.9	284.6	242.9	211.6	187.2	167.6
76	435.7	347.2	288.1	245.9	214.2	189.5	169.7
77	441.0	351.4	291.7	248.9	216.9	191.9	171.8
78	446.4	355.7	295.2	252.0	219.5	194.2	173.9
79	451.7	359.9	298.7	255.0	222.1	196.5	176.0
80	457.0	364.2	302.3	258.0	224.8	198.9	178.1
81	462.3	368.4	305.8	261.0	227.4	201.2	180.2
82	467.6	372.7	309.3	264.0	230.0	203.6	182.3
83	472.9	376.9	312.9	267.1	232.7	205.9	184.4
84	478.3	381.2	316.4	270.1	235.3	208.2	186.5
85	483.6	385.4	319.9	273.1	237.9	210.6	188.6
86	488.9	389.6	323.4	276.1	240.6	212.9	190.7
87	494.2	393.9	327.0	279.1	243.2	215.2	192.8
88	499.5	398.1	330.5	282.1	245.8	217.6	194.9
89	504.8	402.3	334.0	285.2	248.5	219.9	197.0
90	510.1	406.6	337.5	288.2	251.1	222.3	199.1
91	515.4	410.8	341.0	291.2	253.7	224.6	201.2
92	520.7	415.0	344.6	294.2	256.4	226.9	203.3
93	526.0	419.3	348.1	297.2	259.0	229.2	205.4
94	531.3	423.5	351.6	300.2	261.6	231.6	207.5
95	536.6	427.7	355.1	303.2	264.3	233.9	209.6
96	541.9	432.0	358.6	306.2	266.9	236.2	211.7
97	547.2	436.2	362.1	309.2	269.5	238.6	213.8
98	552.5	440.4	365.7	312.2	272.1	240.9	215.9
99	557.7	444.6	369.2	315.2	274.8	243.2	218.0
100	563.0	448.8	372.7	318.2	277.4	245.6	220.1

100p

c	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
0	1609	160.2	79.67	31.38	22.18	15.28	9.904	7.213
1	2994	298.5	148.8	58.89	41.77	28.93	18.94	13.94
2	4278	426.8	212.9	84.44	59.98	41.64	27.36	20.22
3	5514	550.3	274.5	109.1	77.52	53.87	35.48	26.27
4	6720	670.8	334.7	133.1	94.64	65.83	43.41	32.19
5	7905	789.2	393.9	156.7	111.5	77.58	51.22	38.02
6	9074	906.0	452.3	180.0	128.1	89.19	58.92	43.78
7	10240	1022	510.1	203.1	144.6	100.7	66.56	49.48
8	11380	1137	567.3	225.9	160.9	112.1	74.13	55.14
9	12520	1251	624.2	248.6	177.1	123.4	81.65	60.76
10	13650	1364	680.8	271.2	193.2	134.7	89.13	66.35
11	14780	1476	737.0	293.7	209.2	145.9	96.57	71.92
12	15900	1588	793.0	316.0	225.2	157.0	104.0	77.46
13	17020	1700	848.7	338.3	241.1	168.1	111.4	82.98
14	18130	1811	904.2	360.5	256.9	179.2	118.8	88.48
15	19240	1922	959.6	382.6	272.7	190.2	126.1	93.96
16	20340	2032	1015	404.6	288.4	201.2	133.4	99.43
17	21440	2142	1070	426.6	304.1	212.2	140.7	104.9
18	22540	2252	1125	448.5	319.7	223.1	148.0	110.4
19	23640	2362	1180	470.4	335.3	234.0	155.2	115.8
20	24730	2471	1235	492.2	350.9	244.9	162.5	121.2
21	25820	2580	1289	514.0	366.5	255.8	169.7	126.6
22	26910	2689	1343	535.7	382.0	266.6	176.9	132.0
23	28000	2798	1398	557.5	397.5	277.5	184.1	137.4
24	29080	2906	1452	579.1	412.9	288.3	191.3	142.8
25	30170	3014	1506	600.8	428.4	299.1	198.5	148.2
26	31250	3123	1560	622.4	443.8	309.8	205.7	153.5
27	32330	3231	1614	643.9	459.2	320.6	212.8	158.9
28	33410	3339	1668	665.5	474.6	331.4	220.0	164.3
29	34490	3446	1722	687.0	489.9	342.1	227.1	169.6
30	35560	3554	1776	708.5	505.3	352.8	234.3	175.0
31	36640	3661	1830	730.0	520.6	363.5	241.4	180.3
32	37710	3769	1883	751.4	535.9	374.3	248.5	185.6
33	38790	3876	1937	772.8	551.2	384.9	255.6	190.9
34	39860	3983	1990	794.2	566.5	395.6	262.7	196.3
35	40930	4090	2044	815.6	581.7	406.3	269.8	201.6
36	42000	4197	2097	837.0	597.0	417.0	276.9	206.9
37	43070	4304	2151	858.3	612.2	427.6	284.0	212.2
38	44140	4411	2204	879.7	627.4	438.3	291.1	217.5
39	45200	4518	2258	901.0	642.7	448.9	298.2	222.8
40	46270	4624	2311	922.3	657.9	459.5	305.3	228.1
41	47340	4731	2364	943.5	673.0	470.2	312.3	233.4
42	48400	4837	2417	964.8	688.2	480.8	319.4	238.7
43	49470	4944	2470	986.1	703.4	491.4	326.5	244.0
44	50530	5050	2524	1008	718.5	502.0	333.5	249.3
45	51590	5156	2577	1029	733.7	512.6	340.6	254.5
46	52650	5262	2630	1050	748.8	523.2	347.6	259.8
47	53710	5368	2683	1071	764.0	533.7	354.7	265.1
48	54770	5474	2736	1093	779.1	544.3	361.7	270.4
49	55830	5580	2789	1114	794.2	554.9	368.7	275.6
50	56890	5686	2842	1135	809.3	565.5	375.8	280.9

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
0	7.213	5.595	4.513	3.737	3.151	2.693	2.322
1	13.94	10.94	8.925	7.487	6.405	5.558	4.878
2	20.22	15.93	13.06	11.01	9.459	8.254	7.285
3	26.27	20.74	17.05	14.41	12.42	10.87	9.621
4	32.19	25.46	20.96	17.74	15.32	13.43	11.92
5	38.02	30.10	24.81	21.03	18.18	15.96	14.18
6	43.78	34.69	28.62	24.27	21.01	18.46	16.42
7	49.48	39.23	32.39	27.49	23.82	20.95	18.64
8	55.14	43.74	36.13	30.69	26.60	23.41	20.85
9	60.76	48.22	39.85	33.87	29.37	25.86	23.05
10	66.35	52.68	43.56	37.03	32.13	28.30	25.24
11	71.92	57.12	47.24	40.18	34.87	30.73	27.42
12	77.46	61.54	50.91	43.31	37.60	33.16	29.59
13	82.98	65.94	54.57	46.44	40.33	35.57	31.75
14	88.48	70.32	58.21	49.55	43.05	37.98	33.91
15	93.96	74.70	61.85	52.66	45.76	40.38	36.06
16	99.43	79.06	65.47	55.76	48.46	42.77	38.21
17	104.9	83.41	69.09	58.85	51.15	45.16	40.35
18	110.4	87.76	72.70	61.93	53.85	47.55	42.49
19	115.8	92.09	76.30	65.01	56.53	49.93	44.63
20	121.2	96.41	79.89	68.08	59.21	52.30	46.76
21	126.6	100.8	83.48	71.15	61.89	54.68	48.89
22	132.0	105.1	87.07	74.21	64.56	57.05	51.02
23	137.4	109.4	90.64	77.27	67.23	59.41	53.14
24	142.8	113.7	94.22	80.33	69.90	61.78	55.26
25	148.2	118.0	97.78	83.38	72.56	64.14	57.38
26	153.5	122.3	101.4	86.43	75.22	66.49	59.50
27	158.9	126.5	104.9	89.47	77.88	68.85	61.61
28	164.3	130.8	108.5	92.51	80.53	71.20	63.73
29	169.6	135.1	112.1	95.54	83.18	73.55	65.84
30	175.0	139.4	115.6	98.58	85.83	75.90	67.94
31	180.3	143.6	119.1	101.7	88.48	78.25	70.05
32	185.6	147.9	122.7	104.7	91.12	80.59	72.16
33	190.9	152.1	126.2	107.7	93.76	82.94	74.26
34	196.3	156.4	129.8	110.7	96.40	85.28	76.36
35	201.6	160.6	133.3	113.8	99.04	87.62	78.46
36	206.9	164.9	136.8	116.8	101.7	89.95	80.56
37	212.2	169.1	140.3	119.8	104.4	92.29	82.66
38	217.5	173.3	143.9	122.8	107.0	94.62	84.76
39	222.8	177.6	147.4	125.8	109.6	96.96	86.85
40	228.1	181.8	150.9	128.8	112.2	99.29	88.94
41	233.4	186.0	154.4	131.8	114.9	101.7	91.04
42	238.7	190.2	157.9	134.8	117.5	104.0	93.13
43	244.0	194.5	161.4	137.8	120.1	106.3	95.22
44	249.3	198.7	165.0	140.8	122.7	108.6	97.31
45	254.5	202.9	168.5	143.8	125.4	111.0	99.40
46	259.8	207.1	172.0	146.8	128.0	113.3	101.5
47	265.1	211.3	175.5	149.8	130.6	115.6	103.6
48	270.4	215.5	179.0	152.8	133.2	117.9	105.7
49	275.6	219.8	182.5	155.8	135.8	120.3	107.8
50	280.9	224.0	186.0	158.8	138.5	122.6	109.9

Table of n satisfying the equation B(c,n,p)= 0.200

c	100p 0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
51	57950	5792	2895	1156	824.4	576.0	382.8	286.2
52	59010	5898	2947	1177	839.5	586.6	389.8	291.4
53	60070	6004	3000	1198	854.6	597.1	396.8	296.7
54	61130	6109	3053	1219	869.6	607.7	403.9	301.9
55	62180	6215	3106	1240	884.7	618.2	410.9	307.2
56	63240	6321	3159	1262	899.8	628.7	417.9	312.4
57	64290	6426	3211	1283	914.8	639.3	424.9	317.7
58	65350	6532	3264	1304	929.9	649.8	431.9	322.9
59	66400	6637	3317	1325	944.9	660.3	438.9	328.2
60	67460	6743	3370	1346	959.9	670.8	445.9	333.4
61	68510	6848	3422	1367	975.0	681.3	452.9	338.7
62	69570	6953	3475	1388	990.0	691.8	459.9	343.9
63	70620	7058	3528	1409	1005	702.3	466.9	349.1
64	71670	7164	3580	1430	1020	712.8	473.9	354.4
65	72720	7269	3633	1451	1035	723.3	480.9	359.6
66	73780	7374	3685	1472	1050	733.8	487.8	364.8
67	74830	7479	3738	1493	1065	744.3	494.8	370.1
68	75880	7584	3790	1514	1080	754.8	501.8	375.3
69	76930	7689	3843	1535	1095	765.3	508.8	380.5
70	77980	7794	3895	1556	1110	775.7	515.8	385.7
71	79030	7899	3948	1577	1125	786.2	522.7	391.0
72	80080	8004	4000	1598	1140	796.7	529.7	396.2
73	81130	8109	4053	1619	1155	807.1	536.7	401.4
74	82180	8214	4105	1640	1170	817.6	543.6	406.6
75	83220	8319	4158	1661	1185	828.1	550.6	411.8
76	84270	8423	4210	1682	1200	838.5	557.6	417.1
77	85320	8528	4262	1703	1215	849.0	564.5	422.3
78	86370	8633	4315	1724	1230	859.4	571.5	427.5
79	87410	8738	4367	1745	1245	869.9	578.5	432.7
80	88460	8842	4419	1765	1260	880.3	585.4	437.9
81	89510	8947	4472	1786	1275	890.8	592.4	443.1
82	90560	9052	4524	1807	1290	901.2	599.3	448.3
83	91600	9156	4576	1828	1305	911.7	606.3	453.5
84	92650	9261	4628	1849	1320	922.1	613.2	458.7
85	93690	9365	4681	1870	1335	932.5	620.2	463.9
86	94740	9470	4733	1891	1349	943.0	627.1	469.1
87	95780	9574	4785	1912	1364	953.4	634.0	474.4
88	96830	9679	4837	1933	1379	963.8	641.0	479.6
89	97870	9783	4890	1953	1394	974.2	647.9	484.7
90	98920	9888	4942	1974	1409	984.6	654.9	489.9
91	99960	9992	4994	1995	1424	995.1	661.8	495.1
92	101000	10100	5046	2016	1439	1006	668.7	500.3
93	102100	10210	5098	2037	1454	1016	675.7	505.5
94	103100	10310	5150	2058	1469	1027	682.6	510.7
95	104200	10410	5203	2079	1483	1037	689.5	515.9
96	105200	10520	5255	2099	1498	1048	696.5	521.1
97	106300	10620	5307	2120	1513	1058	703.4	526.3
98	107300	10730	5359	2141	1528	1068	710.3	531.5
99	108300	10830	5411	2162	1543	1079	717.3	536.7
100	109400	10930	5463	2183	1558	1089	724.2	541.9

c	100p 20.0	25.0	30.0	35.0	40.0	45.0	50.0
51	286.2	228.2	189.5	161.8	141.1	124.9	112.0
52	291.4	232.4	193.0	164.8	143.7	127.2	114.0
53	296.7	236.6	196.5	167.8	146.3	129.5	116.1
54	301.9	240.8	200.0	170.8	148.9	131.9	118.2
55	307.2	245.0	203.4	173.8	151.5	134.2	120.3
56	312.4	249.2	206.9	176.8	154.1	136.5	122.4
57	317.7	253.3	210.4	179.8	156.7	138.8	124.4
58	322.9	257.5	213.9	182.7	159.3	141.1	126.5
59	328.2	261.7	217.4	185.7	161.9	143.4	128.6
60	333.4	265.9	220.9	188.7	164.5	145.7	130.7
61	338.7	270.1	224.4	191.7	167.2	148.0	132.7
62	343.9	274.3	227.9	194.7	169.8	150.4	134.8
63	349.1	278.5	231.3	197.6	172.4	152.7	136.9
64	354.4	282.7	234.8	200.6	175.0	155.0	139.0
65	359.6	286.8	238.3	203.6	177.6	157.3	141.0
66	364.8	291.0	241.8	206.6	180.2	159.6	143.1
67	370.1	295.2	245.2	209.6	182.8	161.9	145.2
68	375.3	299.4	248.7	212.5	185.4	164.2	147.3
69	380.5	303.5	252.2	215.5	188.0	166.5	149.3
70	385.7	307.7	255.7	218.5	190.6	168.8	151.4
71	391.0	311.9	259.1	221.4	193.1	171.1	153.5
72	396.2	316.1	262.6	224.4	195.7	173.4	155.5
73	401.4	320.2	266.1	227.4	198.3	175.7	157.6
74	406.6	324.4	269.6	230.4	200.9	178.0	159.7
75	411.8	328.6	273.0	233.3	203.5	180.3	161.8
76	417.1	332.7	276.5	236.3	206.1	182.6	163.8
77	422.3	336.9	280.0	239.3	208.7	184.9	165.9
78	427.5	341.1	283.4	242.2	211.3	187.2	168.0
79	432.7	345.2	286.9	245.2	213.9	189.5	170.0
80	437.9	349.4	290.4	248.2	216.5	191.8	172.1
81	443.1	353.6	293.8	251.1	219.1	194.1	174.2
82	448.3	357.7	297.3	254.1	221.7	196.4	176.2
83	453.5	361.9	300.7	257.1	224.3	198.7	178.3
84	458.7	366.0	304.2	260.0	226.8	201.0	180.4
85	463.9	370.2	307.7	263.0	229.4	203.3	182.4
86	469.1	374.3	311.1	265.9	232.0	205.6	184.5
87	474.4	378.5	314.6	268.9	234.6	207.9	186.5
88	479.6	382.7	318.0	271.9	237.2	210.2	188.6
89	484.7	386.8	321.5	274.8	239.8	212.5	190.7
90	489.9	391.0	325.0	277.8	242.4	214.8	192.7
91	495.1	395.1	328.4	280.7	245.0	217.1	194.8
92	500.3	399.3	331.9	283.7	247.5	219.4	196.9
93	505.5	403.4	335.3	286.7	250.1	221.7	198.9
94	510.7	407.6	338.8	289.6	252.7	224.0	201.0
95	515.9	411.7	342.2	292.6	255.3	226.3	203.0
96	521.1	415.9	345.7	295.5	257.9	228.6	205.1
97	526.3	420.0	349.1	298.5	260.5	230.9	207.2
98	531.5	424.2	352.6	301.4	263.0	233.2	209.2
99	536.7	428.3	356.0	304.4	265.6	235.4	211.3
100	541.9	432.5	359.5	307.3	268.2	237.7	213.3

Table of n satisfying the equation B(c,n,p)= 0.500

100p

c	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
0	692.8	68.97	34.31	13.51	9.551	6.579	4.265	3.106
1	1678	167.5	83.58	33.23	23.64	16.44	10.85	8.047
2	2674	267.1	133.4	53.14	37.86	26.40	17.49	13.03
3	3672	366.9	183.3	73.10	52.12	36.38	24.14	18.02
4	4671	466.8	233.2	93.08	66.39	46.37	30.80	23.02
5	5670	566.7	283.2	113.1	80.67	56.37	37.46	28.01
6	6669	666.6	333.1	133.1	94.95	66.36	44.13	33.01
7	7669	766.6	383.1	153.1	109.2	76.36	50.79	38.01
8	8669	866.6	433.1	173.0	123.5	86.35	57.46	43.01
9	9668	966.5	483.1	193.0	137.8	96.35	64.12	48.01
10	10670	1067	533.1	213.0	152.1	106.4	70.79	53.01
11	11670	1167	583.1	233.0	166.4	116.3	77.45	58.01
12	12670	1266	633.1	253.0	180.6	126.3	84.12	63.01
13	13670	1366	683.1	273.0	194.9	136.3	90.79	68.01
14	14670	1466	733.1	293.0	209.2	146.3	97.45	73.01
15	15670	1566	783.1	313.0	223.5	156.3	104.1	78.01
16	16670	1666	833.1	333.0	237.8	166.3	110.8	83.00
17	17670	1766	883.1	353.0	252.1	176.3	117.5	88.00
18	18670	1866	933.1	373.0	266.3	186.3	124.1	93.00
19	19670	1966	983.0	393.0	280.6	196.3	130.8	98.00
20	20670	2066	1033	413.0	294.9	206.3	137.5	103.0
21	21670	2166	1083	433.0	309.2	216.3	144.1	108.0
22	22670	2266	1133	453.0	323.5	226.3	150.8	113.0
23	23670	2366	1183	473.0	337.8	236.3	157.4	118.0
24	24670	2466	1233	493.0	352.1	246.3	164.1	123.0
25	25670	2566	1283	513.0	366.3	256.3	170.8	128.0
26	26670	2666	1333	533.0	380.6	266.3	177.4	133.0
27	27670	2766	1383	553.0	394.9	276.3	184.1	138.0
28	28670	2866	1433	573.0	409.2	286.3	190.8	143.0
29	29670	2966	1483	593.0	423.5	296.3	197.4	148.0
30	30670	3066	1533	613.0	437.8	306.3	204.1	153.0
31	31670	3166	1583	633.0	452.1	316.3	210.8	158.0
32	32670	3266	1633	653.0	466.3	326.3	217.4	163.0
33	33670	3366	1683	673.0	480.6	336.3	224.1	168.0
34	34670	3466	1733	693.0	494.9	346.3	230.8	173.0
35	35670	3566	1783	713.0	509.2	356.3	237.4	178.0
36	36670	3666	1833	733.0	523.5	366.3	244.1	183.0
37	37670	3766	1883	753.0	537.8	376.3	250.8	188.0
38	38670	3866	1933	773.0	552.1	386.3	257.4	193.0
39	39670	3966	1983	793.0	566.3	396.3	264.1	198.0
40	40670	4066	2033	813.0	580.6	406.3	270.8	203.0
41	41670	4166	2083	833.0	594.9	416.3	277.4	208.0
42	42670	4266	2133	853.0	609.2	426.3	284.1	213.0
43	43670	4366	2183	873.0	623.5	436.3	290.8	218.0
44	44670	4466	2233	893.0	637.8	446.3	297.4	223.0
45	45670	4566	2283	913.0	652.1	456.3	304.1	228.0
46	46670	4666	2333	933.0	666.3	466.3	310.8	233.0
47	47670	4766	2383	953.0	680.6	476.3	317.4	238.0
48	48670	4866	2433	973.0	694.9	486.3	324.1	243.0
49	49670	4966	2483	993.0	709.2	496.3	330.8	248.0
50	50670	5066	2533	1013	723.5	506.3	337.4	253.0

Table of n satisfying the equation B(c,n,p)= 0.500

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
0	3.106	2.409	1.943	1.609	1.357	1.159	1.000
1	8.047	6.367	5.247	4.446	3.844	3.376	3.000
2	13.03	10.35	8.571	7.297	6.340	5.596	5.000
3	18.02	14.35	11.90	10.15	8.838	7.817	7.000
4	23.02	18.35	15.23	13.01	11.34	10.04	9.000
5	28.01	22.34	18.56	15.86	13.84	12.26	11.00
6	33.01	26.34	21.90	18.72	16.34	14.48	13.00
7	38.01	30.34	25.23	21.58	18.84	16.70	15.00
8	43.01	34.34	28.56	24.43	21.34	18.93	17.00
9	48.01	38.34	31.89	27.29	23.84	21.15	19.00
10	53.01	42.34	35.23	30.15	26.34	23.37	21.00
11	58.01	46.34	38.56	33.00	28.83	25.59	23.00
12	63.01	50.34	41.89	35.86	31.33	27.82	25.00
13	68.01	54.34	45.23	38.72	33.83	30.04	27.00
14	73.01	58.34	48.56	41.57	36.33	32.26	29.00
15	78.01	62.34	51.89	44.43	38.83	34.48	31.00
16	83.00	66.34	55.22	47.29	41.33	36.70	33.00
17	88.00	70.34	58.56	50.14	43.83	38.93	35.00
18	93.00	74.34	61.89	53.00	46.33	41.15	37.00
19	98.00	78.34	65.22	55.86	48.83	43.37	39.00
20	103.0	82.34	68.56	58.72	51.33	45.59	41.00
21	108.0	86.34	71.89	61.57	53.83	47.82	43.00
22	113.0	90.34	75.22	64.43	56.33	50.04	45.00
23	118.0	94.34	78.56	67.29	58.83	52.26	47.00
24	123.0	98.34	81.89	70.14	61.33	54.48	49.00
25	128.0	102.3	85.22	73.00	63.83	56.70	51.00
26	133.0	106.3	88.56	75.86	66.33	58.93	53.00
27	138.0	110.3	91.89	78.72	68.83	61.15	55.00
28	143.0	114.3	95.22	81.57	71.33	63.37	57.00
29	148.0	118.3	98.56	84.43	73.83	65.59	59.00
30	153.0	122.3	101.9	87.29	76.33	67.82	61.00
31	158.0	126.3	105.2	90.14	78.83	70.04	63.00
32	163.0	130.3	108.6	93.00	81.33	72.26	65.00
33	168.0	134.3	111.9	95.86	83.83	74.48	67.00
34	173.0	138.3	115.2	98.72	86.33	76.70	69.00
35	178.0	142.3	118.6	101.6	88.83	78.93	71.00
36	183.0	146.3	121.9	104.4	91.33	81.15	73.00
37	188.0	150.3	125.2	107.3	93.83	83.37	75.00
38	193.0	154.3	128.6	110.1	96.33	85.59	77.00
39	198.0	158.3	131.9	113.0	98.83	87.82	79.00
40	203.0	162.3	135.2	115.9	101.3	90.04	81.00
41	208.0	166.3	138.6	118.7	103.8	92.26	83.00
42	213.0	170.3	141.9	121.6	106.3	94.48	85.00
43	218.0	174.3	145.2	124.4	108.8	96.70	87.00
44	223.0	178.3	148.6	127.3	111.3	98.93	89.00
45	228.0	182.3	151.9	130.1	113.8	101.1	91.00
46	233.0	186.3	155.2	133.0	116.3	103.4	93.00
47	238.0	190.3	158.6	135.9	118.8	105.6	95.00
48	243.0	194.3	161.9	138.7	121.3	107.8	97.00
49	248.0	198.3	165.2	141.6	123.8	110.0	99.00
50	253.0	202.3	168.6	144.4	126.3	112.3	101.0

Table of n satisfying the equation B(c,n,p)= 0.500

100p

c	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
51	51670	5166	2583	1033	737.8	516.3	344.1	258.0
52	52670	5266	2633	1053	752.1	526.3	350.8	263.0
53	53670	5366	2683	1073	766.3	536.3	357.4	268.0
54	54670	5466	2733	1093	780.6	546.3	364.1	273.0
55	55670	5566	2783	1113	794.9	556.3	370.8	278.0
56	56670	5666	2833	1133	809.2	566.3	377.4	283.0
57	57670	5766	2883	1153	823.5	576.3	384.1	288.0
58	58670	5866	2933	1173	837.8	586.3	390.8	293.0
59	59670	5966	2983	1193	852.1	596.3	397.4	298.0
60	60670	6066	3033	1213	866.3	606.3	404.1	303.0
61	61670	6166	3083	1233	880.6	616.3	410.8	308.0
62	62670	6266	3133	1253	894.9	626.3	417.4	313.0
63	63670	6366	3183	1273	909.2	636.3	424.1	318.0
64	64670	6466	3233	1293	923.5	646.3	430.8	323.0
65	65670	6566	3283	1313	937.8	656.3	437.4	328.0
66	66670	6666	3333	1333	952.1	666.3	444.1	333.0
67	67670	6766	3383	1353	966.3	676.3	450.8	338.0
68	68670	6866	3433	1373	980.6	686.3	457.4	343.0
69	69670	6966	3483	1393	994.9	696.3	464.1	348.0
70	70670	7066	3533	1413	1009	706.3	470.8	353.0
71	71670	7166	3583	1433	1023	716.3	477.4	358.0
72	72670	7266	3633	1453	1038	726.3	484.1	363.0
73	73670	7366	3683	1473	1052	736.3	490.8	368.0
74	74670	7466	3733	1493	1066	746.3	497.4	373.0
75	75670	7566	3783	1513	1081	756.3	504.1	378.0
76	76670	7666	3833	1533	1095	766.3	510.8	383.0
77	77670	7766	3883	1553	1109	776.3	517.4	388.0
78	78670	7866	3933	1573	1123	786.3	524.1	393.0
79	79670	7966	3983	1593	1138	796.3	530.8	398.0
80	80670	8066	4033	1613	1152	806.3	537.4	403.0
81	81670	8166	4083	1633	1166	816.3	544.1	408.0
82	82670	8266	4133	1653	1181	826.3	550.8	413.0
83	83670	8366	4183	1673	1195	836.3	557.4	418.0
84	84670	8466	4233	1693	1209	846.3	564.1	423.0
85	85670	8566	4283	1713	1223	856.3	570.8	428.0
86	86670	8666	4333	1733	1238	866.3	577.4	433.0
87	87670	8766	4383	1753	1252	876.3	584.1	438.0
88	88670	8866	4433	1773	1266	886.3	590.8	443.0
89	89670	8966	4483	1793	1281	896.3	597.4	448.0
90	90670	9066	4533	1813	1295	906.3	604.1	453.0
91	91670	9166	4583	1833	1309	916.3	610.8	458.0
92	92670	9266	4633	1853	1323	926.3	617.4	463.0
93	93670	9366	4683	1873	1338	936.3	624.1	468.0
94	94670	9466	4733	1893	1352	946.3	630.8	473.0
95	95670	9566	4783	1913	1366	956.3	637.4	478.0
96	96670	9666	4833	1933	1381	966.3	644.1	483.0
97	97670	9766	4883	1953	1395	976.3	650.8	488.0
98	98670	9866	4933	1973	1409	986.3	657.4	493.0
99	99670	9966	4983	1993	1423	996.3	664.1	498.0
100	100700	10070	5033	2013	1438	1006	670.8	503.0

Table of n satisfying the equation B(c,n,p)= 0.500

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
51	258.0	206.3	171.9	147.3	128.8	114.5	103.0
52	263.0	210.3	175.2	150.1	131.3	116.7	105.0
53	268.0	214.3	178.6	153.0	133.8	118.9	107.0
54	273.0	218.3	181.9	155.9	136.3	121.1	109.0
55	278.0	222.3	185.2	158.7	138.8	123.4	111.0
56	283.0	226.3	188.6	161.6	141.3	125.6	113.0
57	288.0	230.3	191.9	164.4	143.8	127.8	115.0
58	293.0	234.3	195.2	167.3	146.3	130.0	117.0
59	298.0	238.3	198.6	170.1	148.8	132.3	119.0
60	303.0	242.3	201.9	173.0	151.3	134.5	121.0
61	308.0	246.3	205.2	175.9	153.8	136.7	123.0
62	313.0	250.3	208.6	178.7	156.3	138.9	125.0
63	318.0	254.3	211.9	181.6	158.8	141.1	127.0
64	323.0	258.3	215.2	184.4	161.3	143.4	129.0
65	328.0	262.3	218.6	187.3	163.8	145.6	131.0
66	333.0	266.3	221.9	190.1	166.3	147.8	133.0
67	338.0	270.3	225.2	193.0	168.8	150.0	135.0
68	343.0	274.3	228.6	195.9	171.3	152.3	137.0
69	348.0	278.3	231.9	198.7	173.8	154.5	139.0
70	353.0	282.3	235.2	201.6	176.3	156.7	141.0
71	358.0	286.3	238.6	204.4	178.8	158.9	143.0
72	363.0	290.3	241.9	207.3	181.3	161.1	145.0
73	368.0	294.3	245.2	210.1	183.8	163.4	147.0
74	373.0	298.3	248.6	213.0	186.3	165.6	149.0
75	378.0	302.3	251.9	215.9	188.8	167.8	151.0
76	383.0	306.3	255.2	218.7	191.3	170.0	153.0
77	388.0	310.3	258.6	221.6	193.8	172.3	155.0
78	393.0	314.3	261.9	224.4	196.3	174.5	157.0
79	398.0	318.3	265.2	227.3	198.8	176.7	159.0
80	403.0	322.3	268.6	230.1	201.3	178.9	161.0
81	408.0	326.3	271.9	233.0	203.8	181.1	163.0
82	413.0	330.3	275.2	235.9	206.3	183.4	165.0
83	418.0	334.3	278.6	238.7	208.8	185.6	167.0
84	423.0	338.3	281.9	241.6	211.3	187.8	169.0
85	428.0	342.3	285.2	244.4	213.8	190.0	171.0
86	433.0	346.3	288.6	247.3	216.3	192.3	173.0
87	438.0	350.3	291.9	250.1	218.8	194.5	175.0
88	443.0	354.3	295.2	253.0	221.3	196.7	177.0
89	448.0	358.3	298.6	255.9	223.8	198.9	179.0
90	453.0	362.3	301.9	258.7	226.3	201.1	181.0
91	458.0	366.3	305.2	261.6	228.8	203.4	183.0
92	463.0	370.3	308.6	264.4	231.3	205.6	185.0
93	468.0	374.3	311.9	267.3	233.8	207.8	187.0
94	473.0	378.3	315.2	270.1	236.3	210.0	189.0
95	478.0	382.3	318.6	273.0	238.8	212.3	191.0
96	483.0	386.3	321.9	275.9	241.3	214.5	193.0
97	488.0	390.3	325.2	278.7	243.8	216.7	195.0
98	493.0	394.3	328.6	281.6	246.3	218.9	197.0
99	498.0	398.3	331.9	284.4	248.8	221.1	199.0
100	503.0	402.3	335.2	287.3	251.3	223.4	201.0

Table of n satisfying the equation B(c,n,p)= 0.800

c	100p = 0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
0	223.0	22.20	11.04	4.350	3.074	2.117	1.373	1.000
1	824.4	82.52	41.30	16.58	11.87	8.344	5.603	4.237
2	1535	153.7	76.98	30.94	22.17	15.60	10.49	7.946
3	2297	230.0	115.1	46.29	33.17	23.34	15.69	11.88
4	3089	309.4	154.9	62.25	44.60	31.37	21.08	15.95
5	3904	390.9	195.7	78.63	56.33	39.61	26.61	20.12
6	4734	474.0	237.3	95.32	68.27	47.99	32.23	24.36
7	5576	558.3	279.5	112.2	80.39	56.50	37.93	28.65
8	6429	643.6	322.2	129.3	92.64	65.10	43.69	32.99
9	7290	729.7	365.3	146.6	105.0	73.78	49.50	37.37
10	8157	816.6	408.7	164.0	117.4	82.52	55.35	41.78
11	9031	904.0	452.5	181.6	130.0	91.33	61.24	46.22
12	9911	992.0	496.5	199.2	142.6	100.1	67.17	50.68
13	10790	1080	540.8	217.0	155.3	109.0	73.12	55.16
14	11680	1169	585.2	234.8	168.0	118.0	79.10	59.66
15	12570	1258	629.9	252.7	180.8	126.9	85.10	64.17
16	13470	1348	674.7	270.6	193.7	136.0	91.13	68.70
17	14360	1438	719.6	288.6	206.5	145.0	97.17	73.25
18	15270	1528	764.8	306.7	219.5	154.1	103.2	77.81
19	16170	1618	810.0	324.8	232.4	163.1	109.3	82.38
20	17080	1709	855.4	343.0	245.4	172.2	115.3	86.96
21	17980	1800	900.8	361.2	258.5	181.4	121.5	91.55
22	18890	1891	946.4	379.5	271.5	190.5	127.6	96.15
23	19810	1982	992.1	397.8	284.6	199.7	133.7	100.7
24	20720	2074	1037	416.1	297.7	208.9	139.8	105.3
25	21640	2165	1083	434.5	310.8	218.1	146.0	110.0
26	22560	2257	1129	452.9	324.0	227.3	152.1	114.6
27	23470	2349	1175	471.3	337.1	236.5	158.3	119.2
28	24400	2441	1221	489.7	350.3	245.8	164.5	123.9
29	25320	2533	1267	508.2	363.6	255.1	170.7	128.5
30	26240	2626	1314	526.7	376.8	264.3	176.9	133.2
31	27170	2718	1360	545.3	390.0	273.6	183.1	137.8
32	28090	2811	1406	563.8	403.3	282.9	189.3	142.5
33	29020	2904	1453	582.4	416.6	292.2	195.5	147.2
34	29950	2996	1499	601.0	429.9	301.5	201.7	151.9
35	30870	3089	1545	619.6	443.2	310.9	208.0	156.5
36	31810	3182	1592	638.2	456.5	320.2	214.2	161.2
37	32740	3276	1639	656.9	469.8	329.5	220.4	165.9
38	33670	3369	1685	675.6	483.2	338.9	226.7	170.6
39	34600	3462	1732	694.3	496.5	348.3	232.9	175.3
40	35530	3555	1779	713.0	509.9	357.6	239.2	180.0
41	36470	3649	1825	731.7	523.3	367.0	245.5	184.7
42	37400	3742	1872	750.4	536.7	376.4	251.7	189.4
43	38340	3836	1919	769.2	550.1	385.8	258.0	194.1
44	39280	3930	1966	787.9	563.5	395.2	264.3	198.9
45	40210	4024	2013	806.7	576.9	404.6	270.6	203.6
46	41150	4117	2060	825.5	590.3	414.0	276.9	208.3
47	42090	4211	2107	844.3	603.8	423.4	283.1	213.0
48	43030	4305	2154	863.1	617.2	432.8	289.4	217.8
49	43970	4399	2201	882.0	630.7	442.3	295.7	222.5
50	44910	4493	2248	900.8	644.2	451.7	302.0	227.2

Table of n satisfying the equation B(c,n,p)= 0.800

c	100p = 20.0	25.0	30.0	35.0	40.0	45.0	50.0
0	1.000	0.7756	0.6256	0.5179	0.4368	0.3732	0.3219
1	4.237	3.420	2.879	2.494	2.209	1.989	1.815
2	7.946	6.421	5.410	4.691	4.156	3.744	3.417
3	11.88	9.597	8.080	7.001	6.197	5.576	5.084
4	15.95	12.88	10.83	9.382	8.296	7.458	6.793
5	20.12	16.23	13.65	11.81	10.43	9.374	8.530
6	24.36	19.64	16.51	14.27	12.60	11.31	10.29
7	28.65	23.10	19.40	16.77	14.80	13.27	12.06
8	32.99	26.59	22.32	19.28	17.01	15.25	13.85
9	37.37	30.10	25.27	21.82	19.24	17.25	15.66
10	41.78	33.65	28.23	24.37	21.49	19.25	17.47
11	46.22	37.21	31.21	26.94	23.74	21.27	19.29
12	50.68	40.79	34.21	29.52	26.01	23.29	21.12
13	55.16	44.39	37.22	32.11	28.28	25.32	22.96
14	59.66	48.00	40.24	34.71	30.57	27.36	24.80
15	64.17	51.62	43.27	37.31	32.86	29.40	26.65
16	68.70	55.26	46.31	39.93	35.15	31.45	28.50
17	73.25	58.91	49.36	42.55	37.46	33.50	30.35
18	77.81	62.57	52.42	45.18	39.77	35.56	32.21
19	82.38	66.23	55.48	47.82	42.08	37.63	34.08
20	86.96	69.91	58.56	50.46	44.40	39.70	35.94
21	91.55	73.59	61.63	53.11	46.72	41.77	37.82
22	96.15	77.28	64.72	55.76	49.05	43.84	39.69
23	100.7	80.98	67.81	58.41	51.38	45.92	41.57
24	105.3	84.68	70.90	61.07	53.71	48.00	43.44
25	110.0	88.39	74.00	63.74	56.05	50.08	45.33
26	114.6	92.11	77.11	66.40	58.39	52.17	47.21
27	119.2	95.83	80.21	69.07	60.73	54.26	49.09
28	123.9	99.55	83.33	71.75	63.08	56.35	50.98
29	128.5	103.2	86.44	74.43	65.43	58.45	52.87
30	133.2	107.0	89.56	77.11	67.78	60.54	54.76
31	137.8	110.7	92.68	79.79	70.13	62.64	56.66
32	142.5	114.5	95.81	82.48	72.49	64.74	58.55
33	147.2	118.2	98.94	85.17	74.85	66.84	60.45
34	151.9	122.0	102.0	87.86	77.21	68.94	62.35
35	156.5	125.7	105.2	90.55	79.57	71.05	64.25
36	161.2	129.5	108.3	93.25	81.94	73.16	66.15
37	165.9	133.2	111.4	95.94	84.30	75.26	68.05
38	170.6	137.0	114.6	98.64	86.67	77.37	69.95
39	175.3	140.8	117.7	101.3	89.04	79.49	71.86
40	180.0	144.5	120.9	104.0	91.41	81.60	73.76
41	184.7	148.3	124.0	106.7	93.78	83.71	75.67
42	189.4	152.1	127.2	109.4	96.16	85.83	77.58
43	194.1	155.8	130.3	112.1	98.54	87.94	79.49
44	198.9	159.6	133.5	114.8	100.9	90.06	81.40
45	203.6	163.4	136.7	117.6	103.2	92.18	83.31
46	208.3	167.2	139.8	120.3	105.6	94.30	85.22
47	213.0	171.0	143.0	123.0	108.0	96.42	87.14
48	217.8	174.8	146.1	125.7	110.4	98.54	89.05
49	222.5	178.6	149.3	128.4	112.8	100.6	90.97
50	227.2	182.4	152.5	131.1	115.2	102.7	92.88

Table of n satisfying the equation B(c,n,p)= 0.800

c	100p 0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
51	45850	4588	2295	919.6	657.6	461.1	308.3	232.0
52	46790	4682	2342	938.5	671.1	470.6	314.7	236.7
53	47740	4776	2389	957.4	684.6	480.0	321.0	241.4
54	48680	4870	2436	976.3	698.1	489.5	327.3	246.2
55	49620	4965	2483	995.2	711.6	499.0	333.6	250.9
56	50570	5059	2531	1014	725.1	508.4	339.9	255.7
57	51510	5154	2578	1033	738.6	517.9	346.2	260.4
58	52460	5248	2625	1051	752.2	527.4	352.6	265.2
59	53400	5343	2672	1070	765.7	536.9	358.9	269.9
60	54350	5437	2720	1089	779.2	546.3	365.2	274.7
61	55290	5532	2767	1108	792.8	555.8	371.6	279.5
62	56240	5627	2814	1127	806.3	565.3	377.9	284.2
63	57190	5721	2862	1146	819.9	574.8	384.2	289.0
64	58130	5816	2909	1165	833.5	584.3	390.6	293.8
65	59080	5911	2957	1184	847.0	593.8	396.9	298.5
66	60030	6006	3004	1203	860.6	603.3	403.3	303.3
67	60980	6101	3052	1222	874.2	612.9	409.6	308.1
68	61930	6196	3099	1241	887.8	622.4	416.0	312.8
69	62880	6290	3147	1260	901.3	631.9	422.3	317.6
70	63830	6385	3194	1279	914.9	641.4	428.7	322.4
71	64780	6481	3242	1298	928.5	650.9	435.1	327.2
72	65730	6576	3289	1317	942.1	660.5	441.4	331.9
73	66680	6671	3337	1336	955.7	670.0	447.8	336.7
74	67630	6766	3384	1355	969.4	679.5	454.2	341.5
75	68580	6861	3432	1374	983.0	689.1	460.5	346.3
76	69530	6956	3479	1393	996.6	698.6	466.9	351.1
77	70480	7051	3527	1413	1010	708.2	473.3	355.8
78	71440	7147	3575	1432	1023	717.7	479.6	360.6
79	72390	7242	3622	1451	1037	727.3	486.0	365.4
80	73340	7337	3670	1470	1051	736.8	492.4	370.2
81	74300	7433	3718	1489	1064	746.4	498.8	375.0
82	75250	7528	3765	1508	1078	755.9	505.2	379.8
83	76200	7623	3813	1527	1092	765.5	511.5	384.6
84	77160	7719	3861	1546	1105	775.1	517.9	389.4
85	78110	7814	3909	1565	1119	784.6	524.3	394.2
86	79070	7910	3956	1584	1133	794.2	530.7	399.0
87	80020	8005	4004	1604	1146	803.8	537.1	403.8
88	80980	8101	4052	1623	1160	813.4	543.5	408.6
89	81930	8196	4100	1642	1174	822.9	549.9	413.4
90	82890	8292	4148	1661	1187	832.5	556.3	418.2
91	83840	8388	4195	1680	1201	842.1	562.7	423.0
92	84800	8483	4243	1699	1215	851.7	569.1	427.8
93	85760	8579	4291	1718	1228	861.3	575.5	432.6
94	86710	8675	4339	1737	1242	870.8	581.9	437.4
95	87670	8770	4387	1757	1256	880.4	588.3	442.2
96	88630	8866	4435	1776	1269	890.0	594.7	447.0
97	89580	8962	4483	1795	1283	899.6	601.1	451.8
98	90540	9058	4530	1814	1297	909.2	607.5	456.6
99	91500	9153	4578	1833	1310	918.8	613.9	461.4
100	92460	9249	4626	1853	1324	928.4	620.3	466.3

Table of n satisfying the equation B(c,n,p)= 0.800

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
51	232.0	186.2	155.6	133.9	117.5	104.9	94.80
52	236.7	190.0	158.8	136.6	119.9	107.0	96.72
53	241.4	193.8	162.0	139.3	122.3	109.1	98.63
54	246.2	197.6	165.2	142.0	124.7	111.3	100.5
55	250.9	201.4	168.3	144.8	127.1	113.4	102.4
56	255.7	205.2	171.5	147.5	129.5	115.5	104.3
57	260.4	209.0	174.7	150.2	131.9	117.6	106.3
58	265.2	212.8	177.9	152.9	134.3	119.8	108.2
59	269.9	216.6	181.0	155.7	136.7	121.9	110.1
60	274.7	220.4	184.2	158.4	139.1	124.0	112.0
61	279.5	224.2	187.4	161.1	141.5	126.2	114.0
62	284.2	228.0	190.6	163.9	143.9	128.3	115.9
63	289.0	231.9	193.8	166.6	146.3	130.4	117.8
64	293.8	235.7	197.0	169.3	148.7	132.6	119.7
65	298.5	239.5	200.2	172.1	151.1	134.7	121.7
66	303.3	243.3	203.3	174.8	153.5	136.9	123.6
67	308.1	247.1	206.5	177.6	155.9	139.0	125.5
68	312.8	251.0	209.7	180.3	158.3	141.1	127.4
69	317.6	254.8	212.9	183.0	160.7	143.3	129.4
70	322.4	258.6	216.1	185.8	163.1	145.4	131.3
71	327.2	262.4	219.3	188.5	165.5	147.5	133.2
72	331.9	266.3	222.5	191.3	167.9	149.7	135.2
73	336.7	270.1	225.7	194.0	170.3	151.8	137.1
74	341.5	273.9	228.9	196.8	172.7	154.0	139.0
75	346.3	277.8	232.1	199.5	175.1	156.1	141.0
76	351.1	281.6	235.3	202.2	177.5	158.3	142.9
77	355.8	285.4	238.5	205.0	179.9	160.4	144.8
78	360.6	289.3	241.7	207.7	182.3	162.5	146.8
79	365.4	293.1	244.9	210.5	184.7	164.7	148.7
80	370.2	296.9	248.1	213.2	187.1	166.8	150.6
81	375.0	300.8	251.3	216.0	189.5	169.0	152.6
82	379.8	304.6	254.5	218.7	191.9	171.1	154.5
83	384.6	308.4	257.7	221.5	194.4	173.3	156.4
84	389.4	312.3	260.9	224.2	196.8	175.4	158.4
85	394.2	316.1	264.1	227.0	199.2	177.6	160.3
86	399.0	320.0	267.3	229.7	201.6	179.7	162.2
87	403.8	323.8	270.5	232.5	204.0	181.9	164.2
88	408.6	327.7	273.7	235.3	206.4	184.0	166.1
89	413.4	331.5	277.0	238.0	208.8	186.2	168.0
90	418.2	335.4	280.2	240.8	211.2	188.3	170.0
91	423.0	339.2	283.4	243.5	213.7	190.5	171.9
92	427.8	343.0	286.6	246.3	216.1	192.6	173.8
93	432.6	346.9	289.8	249.0	218.5	194.8	175.8
94	437.4	350.7	293.0	251.8	220.9	196.9	177.7
95	442.2	354.6	296.2	254.5	223.3	199.1	179.7
96	447.0	358.4	299.4	257.3	225.7	201.2	181.6
97	451.8	362.3	302.6	260.1	228.2	203.4	183.5
98	456.6	366.2	305.9	262.8	230.6	205.5	185.5
99	461.4	370.0	309.1	265.6	233.0	207.7	187.4
100	466.3	373.9	312.3	268.3	235.4	209.8	189.4

Table of n satisfying the equation B(c,n,p)= 0.900

100p

c	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
0	105.3	10.48	5.215	2.054	1.451	1.000	0.6482	0.4721
1	532.0	53.41	26.82	10.88	7.848	5.576	3.816	2.944
2	1102	110.6	55.55	22.50	16.21	11.50	7.843	6.024
3	1745	175.1	87.87	35.54	25.57	18.11	12.31	9.426
4	2433	244.0	122.4	49.45	35.56	25.14	17.06	13.03
5	3152	316.1	158.5	63.98	45.98	32.48	22.00	16.77
6	3895	390.5	195.7	78.97	56.72	40.04	27.03	20.62
7	4657	466.7	233.9	94.31	67.72	47.78	32.28	24.55
8	5433	544.5	272.9	109.9	78.92	55.66	37.58	28.55
9	6222	623.5	312.4	125.8	90.30	63.65	42.94	32.61
10	7022	703.5	352.5	141.9	101.8	71.75	48.38	36.71
11	7830	784.5	393.0	158.2	113.4	79.93	53.87	40.85
12	8647	866.2	433.9	174.6	125.2	88.19	59.41	45.03
13	9471	948.7	475.2	191.1	137.0	96.52	64.99	49.24
14	10300	1031	516.8	207.8	149.0	104.9	70.61	53.48
15	11130	1115	558.7	224.6	161.0	113.3	76.27	57.75
16	11970	1199	600.8	241.5	173.1	121.8	81.96	62.04
17	12820	1284	643.1	258.5	185.3	130.3	87.67	66.35
18	13670	1369	685.7	275.6	197.5	138.9	93.42	70.67
19	14520	1454	728.5	292.7	209.7	147.5	99.19	75.02
20	15380	1540	771.4	310.0	222.1	156.2	104.9	79.38
21	16240	1626	814.5	327.2	234.4	164.8	110.7	83.76
22	17110	1713	857.8	344.6	246.8	173.6	116.6	88.15
23	17970	1799	901.2	362.0	259.3	182.3	122.4	92.56
24	18840	1887	944.8	379.5	271.8	191.1	128.3	96.97
25	19710	1974	988.4	397.0	284.3	199.8	134.2	101.4
26	20590	2061	1032	414.5	296.9	208.7	140.1	105.8
27	21470	2149	1076	432.1	309.5	217.5	146.0	110.2
28	22350	2237	1120	449.8	322.1	226.3	151.9	114.7
29	23230	2325	1164	467.5	334.7	235.2	157.8	119.2
30	24110	2414	1208	485.2	347.4	244.1	163.8	123.7
31	25000	2502	1252	503.0	360.1	253.0	169.8	128.1
32	25880	2591	1297	520.8	372.9	262.0	175.7	132.6
33	26770	2680	1341	538.6	385.6	270.9	181.7	137.1
34	27660	2769	1386	556.5	398.4	279.9	187.7	141.7
35	28550	2858	1431	574.4	411.2	288.8	193.7	146.2
36	29450	2948	1475	592.3	424.0	297.8	199.7	150.7
37	30340	3037	1520	610.2	436.8	306.8	205.7	155.2
38	31240	3127	1565	628.2	449.7	315.8	211.8	159.8
39	32140	3217	1610	646.2	462.6	324.9	217.8	164.3
40	33040	3307	1655	664.2	475.5	333.9	223.9	168.9
41	33940	3397	1700	682.3	488.4	343.0	229.9	173.4
42	34840	3487	1745	700.4	501.3	352.0	236.0	178.0
43	35740	3577	1790	718.5	514.3	361.1	242.0	182.5
44	36640	3668	1835	736.6	527.2	370.2	248.1	187.1
45	37550	3758	1881	754.7	540.2	379.3	254.2	191.7
46	38450	3849	1926	772.9	553.2	388.4	260.3	196.2
47	39360	3940	1971	791.1	566.2	397.5	266.4	200.8
48	40270	4030	2017	809.3	579.2	406.6	272.5	205.4
49	41180	4121	2062	827.5	592.2	415.8	278.6	210.0
50	42090	4212	2108	845.7	605.3	424.9	284.7	214.6

Table of n satisfying the equation B(c,n,p)= 0.900

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
0	0.4721	0.3662	0.2953	0.2445	0.2062	0.1762	0.1520
1	2.944	2.426	2.086	1.847	1.672	1.540	1.437
2	6.024	4.941	4.226	3.722	3.350	3.067	2.847
3	9.426	7.703	6.563	5.756	5.160	4.703	4.345
4	13.03	10.62	9.025	7.894	7.055	6.411	5.904
5	16.77	13.64	11.57	10.10	9.011	8.170	7.507
6	20.62	16.75	14.19	12.36	11.01	9.967	9.143
7	24.55	19.93	16.85	14.67	13.04	11.79	10.80
8	28.55	23.15	19.56	17.01	15.11	13.64	12.48
9	32.61	26.42	22.31	19.38	17.20	15.52	14.18
10	36.71	29.72	25.08	21.78	19.31	17.41	15.90
11	40.85	33.06	27.88	24.19	21.44	19.32	17.63
12	45.03	36.42	30.70	26.63	23.59	21.23	19.37
13	49.24	39.81	33.54	29.08	25.74	23.17	21.12
14	53.48	43.22	36.40	31.54	27.92	25.11	22.88
15	57.75	46.66	39.28	34.02	30.10	27.06	24.65
16	62.04	50.10	42.17	36.51	32.29	29.02	26.42
17	66.35	53.57	45.07	39.01	34.49	30.99	28.20
18	70.67	57.05	47.98	41.52	36.70	32.96	29.99
19	75.02	60.54	50.91	44.04	38.91	34.94	31.78
20	79.38	64.05	53.84	46.57	41.14	36.93	33.58
21	83.76	67.57	56.79	49.11	43.37	38.92	35.38
22	88.15	71.09	59.74	51.65	45.61	40.92	37.19
23	92.56	74.63	62.71	54.20	47.85	42.92	39.00
24	96.97	78.18	65.68	56.76	50.09	44.93	40.82
25	101.4	81.74	68.65	59.32	52.35	46.94	42.64
26	105.8	85.31	71.64	61.89	54.61	48.96	44.46
27	110.2	88.88	74.63	64.47	56.87	50.98	46.29
28	114.7	92.46	77.62	67.05	59.13	53.00	48.11
29	119.2	96.05	80.63	69.63	61.40	55.03	49.95
30	123.7	99.65	83.63	72.22	63.68	57.06	51.78
31	128.1	103.2	86.65	74.81	65.96	59.09	53.62
32	132.6	106.8	89.67	77.41	68.24	61.13	55.46
33	137.1	110.4	92.69	80.01	70.52	63.16	57.30
34	141.7	114.0	95.72	82.61	72.81	65.21	59.15
35	146.2	117.7	98.75	85.22	75.10	67.25	60.99
36	150.7	121.3	101.7	87.83	77.39	69.30	62.84
37	155.2	124.9	104.8	90.45	79.69	71.35	64.69
38	159.8	128.6	107.8	93.07	81.99	73.40	66.55
39	164.3	132.2	110.9	95.69	84.29	75.45	68.40
40	168.9	135.9	113.9	98.31	86.60	77.51	70.26
41	173.4	139.5	117.0	100.9	88.90	79.56	72.12
42	178.0	143.2	120.0	103.5	91.21	81.62	73.98
43	182.5	146.9	123.1	106.2	93.52	83.68	75.84
44	187.1	150.5	126.2	108.8	95.84	85.75	77.71
45	191.7	154.2	129.2	111.4	98.15	87.81	79.57
46	196.2	157.9	132.3	114.1	100.4	89.88	81.44
47	200.8	161.5	135.4	116.7	102.7	91.95	83.31
48	205.4	165.2	138.5	119.4	105.1	94.02	85.17
49	210.0	168.9	141.5	122.0	107.4	96.09	87.05
50	214.6	172.6	144.6	124.7	109.7	98.16	88.92

Table of n satisfying the equation B(c,n,p)= 0.900

100p

c	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
51	43000	4303	2153	864.0	618.3	434.1	290.8	219.2
52	43910	4395	2199	882.3	631.4	443.2	296.9	223.8
53	44820	4486	2245	900.5	644.4	452.4	303.0	228.4
54	45730	4577	2290	918.9	657.5	461.6	309.2	233.0
55	46650	4669	2336	937.2	670.6	470.7	315.3	237.6
56	47560	4760	2382	955.5	683.7	479.9	321.5	242.3
57	48480	4852	2428	973.9	696.9	489.1	327.6	246.9
58	49390	4943	2474	992.2	710.0	498.3	333.8	251.5
59	50310	5035	2519	1010	723.1	507.5	339.9	256.1
60	51230	5127	2565	1029	736.3	516.8	346.1	260.8
61	52150	5219	2611	1047	749.4	526.0	352.2	265.4
62	53070	5311	2657	1065	762.6	535.2	358.4	270.0
63	53980	5403	2703	1084	775.8	544.4	364.6	274.7
64	54910	5495	2749	1102	789.0	553.7	370.7	279.3
65	55830	5587	2795	1121	802.1	562.9	376.9	284.0
66	56750	5679	2842	1139	815.3	572.2	383.1	288.6
67	57670	5771	2888	1158	828.6	581.4	389.3	293.3
68	58590	5863	2934	1176	841.8	590.7	395.5	297.9
69	59510	5956	2980	1195	855.0	600.0	401.7	302.6
70	60440	6048	3026	1213	868.2	609.3	407.9	307.2
71	61360	6141	3072	1232	881.5	618.5	414.1	311.9
72	62290	6233	3119	1250	894.7	627.8	420.3	316.5
73	63210	6326	3165	1269	908.0	637.1	426.5	321.2
74	64140	6418	3211	1287	921.2	646.4	432.7	325.9
75	65060	6511	3258	1306	934.5	655.7	438.9	330.5
76	65990	6604	3304	1324	947.8	665.0	445.1	335.2
77	66920	6696	3350	1343	961.1	674.3	451.3	339.9
78	67840	6789	3397	1362	974.3	683.6	457.6	344.6
79	68770	6882	3443	1380	987.6	692.9	463.8	349.2
80	69700	6975	3490	1399	1000	702.3	470.0	353.9
81	70630	7068	3536	1417	1014	711.6	476.2	358.6
82	71560	7161	3583	1436	1027	720.9	482.5	363.3
83	72490	7254	3629	1455	1040	730.3	488.7	368.0
84	73420	7347	3676	1473	1054	739.6	494.9	372.7
85	74350	7440	3722	1492	1067	748.9	501.2	377.4
86	75280	7533	3769	1511	1080	758.3	507.4	382.0
87	76210	7626	3816	1529	1094	767.6	513.7	386.7
88	77140	7719	3862	1548	1107	777.0	519.9	391.4
89	78080	7813	3909	1567	1120	786.3	526.2	396.1
90	79010	7906	3955	1585	1134	795.7	532.4	400.8
91	79940	7999	4002	1604	1147	805.1	538.7	405.5
92	80880	8093	4049	1623	1161	814.4	544.9	410.2
93	81810	8186	4096	1641	1174	823.8	551.2	414.9
94	82740	8279	4142	1660	1187	833.2	557.5	419.6
95	83680	8373	4189	1679	1201	842.5	563.7	424.3
96	84610	8466	4236	1698	1214	851.9	570.0	429.1
97	85550	8560	4283	1716	1227	861.3	576.2	433.8
98	86480	8653	4329	1735	1241	870.7	582.5	438.5
99	87420	8747	4376	1754	1254	880.1	588.8	443.2
100	88350	8841	4423	1772	1268	889.5	595.1	447.9

Table of n satisfying the equation B(c,n,p)= 0.900

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
51	219.2	176.3	147.7	127.3	112.0	100.2	90.79
52	223.8	180.0	150.8	130.0	114.4	102.3	92.67
53	228.4	183.7	153.9	132.6	116.7	104.3	94.54
54	233.0	187.4	157.0	135.3	119.0	106.4	96.42
55	237.6	191.1	160.1	137.9	121.4	108.5	98.30
56	242.3	194.8	163.1	140.6	123.7	110.6	100.1
57	246.9	198.5	166.2	143.2	126.0	112.7	102.0
58	251.5	202.2	169.3	145.9	128.4	114.8	103.9
59	256.1	205.9	172.4	148.6	130.7	116.8	105.8
60	260.8	209.6	175.5	151.2	133.0	118.9	107.7
61	265.4	213.3	178.7	153.9	135.4	121.0	109.5
62	270.0	217.0	181.8	156.6	137.7	123.1	111.4
63	274.7	220.8	184.9	159.3	140.1	125.2	113.3
64	279.3	224.5	188.0	161.9	142.4	127.3	115.2
65	284.0	228.2	191.1	164.6	144.8	129.4	117.1
66	288.6	231.9	194.2	167.3	147.1	131.5	119.0
67	293.3	235.7	197.3	170.0	149.5	133.6	120.9
68	297.9	239.4	200.4	172.6	151.8	135.7	122.8
69	302.6	243.1	203.6	175.3	154.2	137.7	124.6
70	307.2	246.9	206.7	178.0	156.5	139.8	126.5
71	311.9	250.6	209.8	180.7	158.9	141.9	128.4
72	316.5	254.3	212.9	183.4	161.2	144.0	130.3
73	321.2	258.1	216.0	186.0	163.6	146.1	132.2
74	325.9	261.8	219.2	188.7	165.9	148.2	134.1
75	330.5	265.6	222.3	191.4	168.3	150.3	136.0
76	335.2	269.3	225.4	194.1	170.6	152.4	137.9
77	339.9	273.1	228.6	196.8	173.0	154.5	139.8
78	344.6	276.8	231.7	199.5	175.4	156.6	141.7
79	349.2	280.6	234.8	202.2	177.7	158.7	143.6
80	353.9	284.3	238.0	204.9	180.1	160.8	145.5
81	358.6	288.1	241.1	207.6	182.4	163.0	147.4
82	363.3	291.8	244.2	210.3	184.8	165.1	149.3
83	368.0	295.6	247.4	212.9	187.2	167.2	151.2
84	372.7	299.3	250.5	215.6	189.5	169.3	153.1
85	377.4	303.1	253.6	218.3	191.9	171.4	155.0
86	382.0	306.9	256.8	221.0	194.3	173.5	156.9
87	386.7	310.6	259.9	223.7	196.6	175.6	158.8
88	391.4	314.4	263.1	226.4	199.0	177.7	160.7
89	396.1	318.2	266.2	229.1	201.4	179.8	162.6
90	400.8	321.9	269.4	231.8	203.7	181.9	164.5
91	405.5	325.7	272.5	234.5	206.1	184.0	166.4
92	410.2	329.5	275.6	237.2	208.5	186.2	168.3
93	414.9	333.2	278.8	240.0	210.9	188.3	170.2
94	419.6	337.0	281.9	242.7	213.2	190.4	172.1
95	424.3	340.8	285.1	245.4	215.6	192.5	174.0
96	429.1	344.5	288.2	248.1	218.0	194.6	176.0
97	433.8	348.3	291.4	250.8	220.4	196.7	177.9
98	438.5	352.1	294.6	253.5	222.7	198.8	179.8
99	443.2	355.9	297.7	256.2	225.1	201.0	181.7
100	447.9	359.7	300.9	258.9	227.5	203.1	183.6

	100p						
c	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
0	51.26	5.103	2.538	1.000	0.7068	0.4868	0.3156	0.2298
1	355.6	35.86	18.09	7.448	5.425	3.913	2.749	2.177
2	818.2	82.36	41.48	16.96	12.30	8.812	6.110	4.773
3	1367	137.4	69.14	28.16	20.36	14.52	10.00	7.752
4	1971	198.0	99.53	40.44	29.19	20.77	14.23	10.97
5	2614	262.5	131.8	53.48	38.56	27.38	18.70	14.38
6	3286	329.8	165.6	67.09	48.33	34.27	23.35	17.91
7	3982	399.5	200.5	81.15	58.42	41.38	28.14	21.55
8	4696	471.1	236.4	95.59	68.77	48.67	33.05	25.27
9	5427	544.3	273.0	110.3	79.34	56.11	38.06	29.06
10	6170	618.8	310.3	125.3	90.09	63.68	43.15	32.91
11	6926	694.4	348.2	140.5	101.0	71.35	48.31	36.82
12	7691	771.1	386.6	155.9	112.0	79.13	53.54	40.77
13	8466	848.6	425.4	171.5	123.2	86.99	58.82	44.76
14	9248	927.0	464.7	187.3	134.5	94.92	64.15	48.79
15	10030	1006	504.2	203.2	145.9	102.9	69.52	52.85
16	10830	1085	544.2	219.2	157.3	110.9	74.93	56.93
17	11630	1166	584.4	235.4	168.9	119.1	80.39	61.05
18	12440	1246	624.8	251.6	180.5	127.2	85.87	65.19
19	13250	1328	665.6	268.0	192.2	135.5	91.38	69.35
20	14070	1410	706.5	284.4	204.0	143.7	96.93	73.53
21	14890	1492	747.7	300.9	215.8	152.0	102.5	77.74
22	15720	1575	789.1	317.5	227.7	160.4	108.1	81.96
23	16550	1658	830.6	334.2	239.7	168.8	113.7	86.19
24	17380	1741	872.4	351.0	251.7	177.2	119.3	90.45
25	18220	1825	914.3	367.8	263.7	185.6	125.0	94.72
26	19060	1909	956.3	384.6	275.8	194.1	130.7	99.00
27	19900	1993	998.6	401.6	287.9	202.6	136.4	103.2
28	20740	2078	1040	418.6	300.0	211.2	142.1	107.6
29	21590	2163	1083	435.6	312.2	219.7	147.8	111.9
30	22440	2248	1126	452.7	324.4	228.3	153.5	116.2
31	23300	2333	1168	469.8	336.7	236.9	159.3	120.6
32	24150	2419	1211	487.0	349.0	245.5	165.1	124.9
33	25010	2505	1254	504.2	361.3	254.2	170.9	129.3
34	25870	2591	1297	521.5	373.7	262.8	176.7	133.6
35	26730	2677	1340	538.8	386.0	271.5	182.5	138.0
36	27590	2763	1383	556.1	398.5	280.2	188.3	142.4
37	28460	2850	1427	573.5	410.9	289.0	194.2	146.8
38	29330	2937	1470	590.9	423.3	297.7	200.0	151.2
39	30200	3023	1514	608.3	435.8	306.4	205.9	155.6
40	31070	3111	1557	625.8	448.3	315.2	211.7	160.0
41	31940	3198	1601	643.3	460.8	324.0	217.6	164.5
42	32810	3285	1645	660.8	473.4	332.8	223.5	168.9
43	33690	3373	1689	678.4	485.9	341.6	229.4	173.3
44	34560	3461	1732	696.0	498.5	350.4	235.3	177.8
45	35440	3548	1776	713.6	511.1	359.3	241.2	182.2
46	36320	3636	1820	731.3	523.7	368.1	247.2	186.7
47	37200	3724	1864	748.9	536.4	377.0	253.1	191.2
48	38080	3813	1909	766.6	549.0	385.9	259.0	195.6
49	38960	3901	1953	784.3	561.7	394.8	265.0	200.1
50	39850	3989	1997	802.1	574.4	403.7	270.9	204.6

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
0	0.2298	0.1782	0.1438	0.1190	0.1004	0.08579	0.07400
1	2.177	1.843	1.627	1.478	1.371	1.292	1.232
2	4.773	3.982	3.465	3.105	2.844	2.649	2.501
3	7.752	6.416	5.537	4.920	4.469	4.128	3.866
4	10.97	9.041	7.763	6.862	6.198	5.694	5.303
5	14.38	11.80	10.09	8.894	8.004	7.325	6.795
6	17.91	14.66	12.51	10.99	9.868	9.005	8.329
7	21.55	17.61	14.99	13.14	11.77	10.72	9.896
8	25.27	20.62	17.53	15.34	13.72	12.47	11.49
9	29.06	23.68	20.11	17.58	15.69	14.24	13.10
10	32.91	26.79	22.73	19.84	17.70	16.04	14.74
11	36.82	29.94	25.38	22.13	19.72	17.86	16.39
12	40.77	33.13	28.06	24.45	21.77	19.70	18.06
13	44.76	36.35	30.76	26.79	23.83	21.54	19.74
14	48.79	39.59	33.49	29.14	25.91	23.41	21.43
15	52.85	42.86	36.23	31.51	28.00	25.28	23.13
16	56.93	46.16	39.00	33.90	30.10	27.17	24.84
17	61.05	49.47	41.78	36.30	32.22	29.06	26.56
18	65.19	52.81	44.57	38.72	34.35	30.97	28.29
19	69.35	56.16	47.38	41.14	36.48	32.88	30.02
20	73.53	59.52	50.21	43.58	38.63	34.80	31.76
21	77.74	62.91	53.04	46.02	40.78	36.73	33.51
22	81.96	66.30	55.89	48.48	42.95	38.66	35.27
23	86.19	69.71	58.75	50.94	45.12	40.61	37.02
24	90.45	73.13	61.62	53.42	47.29	42.55	38.79
25	94.72	76.57	64.49	55.90	49.47	44.51	40.56
26	99.00	80.01	67.38	58.38	51.66	46.46	42.33
27	103.2	83.46	70.27	60.88	53.86	48.42	44.11
28	107.6	86.93	73.18	63.38	56.06	50.39	45.89
29	111.9	90.40	76.08	65.89	58.26	52.36	47.67
30	116.2	93.88	79.00	68.40	60.47	54.34	49.46
31	120.6	97.37	81.92	70.92	62.69	56.32	51.25
32	124.9	100.8	84.85	73.44	64.91	58.30	53.05
33	129.3	104.3	87.79	75.97	67.13	60.29	54.84
34	133.6	107.8	90.73	78.50	69.36	62.28	56.65
35	138.0	111.4	93.68	81.04	71.59	64.27	58.45
36	142.4	114.9	96.63	83.58	73.83	66.27	60.26
37	146.8	118.4	99.59	86.13	76.07	68.27	62.07
38	151.2	122.0	102.5	88.68	78.31	70.27	63.88
39	155.6	125.5	105.5	91.24	80.55	72.28	65.69
40	160.0	129.1	108.4	93.79	82.80	74.29	67.51
41	164.5	132.6	111.4	96.36	85.06	76.30	69.33
42	168.9	136.2	114.4	98.92	87.31	78.31	71.15
43	173.3	139.7	117.4	101.4	89.57	80.33	72.97
44	177.8	143.3	120.4	104.0	91.83	82.35	74.80
45	182.2	146.9	123.4	106.6	94.09	84.37	76.62
46	186.7	150.5	126.4	109.2	96.36	86.39	78.45
47	191.2	154.1	129.4	111.8	98.63	88.42	80.28
48	195.6	157.7	132.4	114.3	100.9	90.44	82.11
49	200.1	161.2	135.4	116.9	103.1	92.47	83.95
50	204.6	164.8	138.4	119.5	105.4	94.50	85.79

Table of n satisfying the equation $B(c,n,p) = 0.950$

c	100p 0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
51	40730	4078	2041	819.8	587.1	412.6	276.9	209.1
52	41620	4167	2086	837.6	599.8	421.5	282.9	213.6
53	42510	4256	2130	855.4	612.6	430.4	288.8	218.1
54	43400	4344	2175	873.2	625.3	439.4	294.8	222.6
55	44290	4433	2219	891.1	638.1	448.3	300.8	227.1
56	45180	4522	2264	909.0	650.8	457.3	306.8	231.6
57	46070	4612	2308	926.8	663.6	466.3	312.8	236.1
58	46960	4701	2353	944.7	676.4	475.2	318.8	240.6
59	47850	4790	2398	962.7	689.2	484.2	324.8	245.1
60	48750	4880	2442	980.6	702.1	493.2	330.8	249.7
61	49640	4969	2487	998.5	714.9	502.2	336.8	254.2
62	50540	5059	2532	1016	727.8	511.2	342.9	258.7
63	51430	5149	2577	1034	740.6	520.2	348.9	263.3
64	52330	5238	2622	1052	753.5	529.3	354.9	267.8
65	53230	5328	2667	1070	766.4	538.3	361.0	272.4
66	54130	5418	2712	1088	779.3	547.3	367.0	276.9
67	55030	5508	2757	1106	792.2	556.4	373.1	281.5
68	55930	5598	2802	1124	805.1	565.5	379.1	286.0
69	56830	5689	2847	1142	818.0	574.5	385.2	290.6
70	57730	5779	2892	1160	830.9	583.6	391.2	295.1
71	58640	5869	2937	1178	843.9	592.7	397.3	299.7
72	59540	5959	2983	1197	856.8	601.7	403.4	304.3
73	60440	6050	3028	1215	869.8	610.8	409.5	308.8
74	61350	6140	3073	1233	882.8	619.9	415.5	313.4
75	62250	6231	3118	1251	895.8	629.0	421.6	318.0
76	63160	6322	3164	1269	908.7	638.1	427.7	322.6
77	64060	6412	3209	1287	921.7	647.2	433.8	327.1
78	64970	6503	3255	1306	934.7	656.4	439.9	331.7
79	65880	6594	3300	1324	947.8	665.5	446.0	336.3
80	66790	6685	3345	1342	960.8	674.6	452.1	340.9
81	67700	6776	3391	1360	973.8	683.7	458.2	345.5
82	68610	6867	3436	1378	986.8	692.9	464.3	350.1
83	69520	6958	3482	1397	999.9	702.0	470.4	354.7
84	70430	7049	3528	1415	1012	711.2	476.5	359.3
85	71340	7140	3573	1433	1026	720.3	482.7	363.9
86	72250	7231	3619	1451	1039	729.5	488.8	368.5
87	73160	7322	3664	1470	1052	738.7	494.9	373.1
88	74070	7414	3710	1488	1065	747.8	501.0	377.7
89	74990	7505	3756	1506	1078	757.0	507.2	382.3
90	75900	7596	3801	1525	1091	766.2	513.3	386.9
91	76810	7688	3847	1543	1104	775.4	519.4	391.5
92	77730	7779	3893	1561	1117	784.6	525.6	396.2
93	78640	7871	3939	1580	1130	793.7	531.7	400.8
94	79560	7962	3985	1598	1143	802.9	537.9	405.4
95	80470	8054	4030	1616	1157	812.1	544.0	410.0
96	81390	8146	4076	1635	1170	821.4	550.2	414.6
97	82310	8237	4122	1653	1183	830.6	556.3	419.3
98	83220	8329	4168	1671	1196	839.8	562.5	423.9
99	84140	8421	4214	1690	1209	849.0	568.6	428.5
100	85060	8513	4260	1708	1222	858.2	574.8	433.2

	100p						
c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
51	209.1	168.4	141.4	122.1	107.7	96.54	87.62
52	213.6	172.1	144.4	124.7	110.0	98.57	89.46
53	218.1	175.7	147.4	127.3	112.2	100.6	91.30
54	222.6	179.3	150.5	129.9	114.5	102.6	93.14
55	227.1	182.9	153.5	132.5	116.8	104.6	94.99
56	231.6	186.5	156.5	135.1	119.1	106.7	96.83
57	236.1	190.1	159.5	137.7	121.4	108.7	98.68
58	240.6	193.8	162.6	140.3	123.7	110.8	100.5
59	245.1	197.4	165.6	142.9	126.0	112.8	102.3
60	249.7	201.0	168.6	145.5	128.3	114.9	104.2
61	254.2	204.7	171.7	148.2	130.6	116.9	106.0
62	258.7	208.3	174.7	150.8	132.9	119.0	107.9
63	263.3	211.9	177.8	153.4	135.2	121.0	109.7
64	267.8	215.6	180.8	156.0	137.5	123.1	111.6
65	272.4	219.2	183.9	158.6	139.8	125.1	113.4
66	276.9	222.9	186.9	161.3	142.1	127.2	115.3
67	281.5	226.5	190.0	163.9	144.4	129.2	117.2
68	286.0	230.2	193.0	166.5	146.7	131.3	119.0
69	290.6	233.9	196.1	169.1	149.0	133.4	120.9
70	295.1	237.5	199.1	171.8	151.3	135.4	122.7
71	299.7	241.2	202.2	174.4	153.6	137.5	124.6
72	304.3	244.8	205.3	177.0	155.9	139.5	126.5
73	308.8	248.5	208.3	179.7	158.2	141.6	128.3
74	313.4	252.2	211.4	182.3	160.6	143.7	130.2
75	318.0	255.8	214.5	185.0	162.9	145.7	132.1
76	322.6	259.5	217.5	187.6	165.2	147.8	133.9
77	327.1	263.2	220.6	190.2	167.5	149.9	135.8
78	331.7	266.9	223.7	192.9	169.8	151.9	137.7
79	336.3	270.6	226.8	195.5	172.1	154.0	139.5
80	340.9	274.2	229.8	198.2	174.5	156.1	141.4
81	345.5	277.9	232.9	200.8	176.8	158.1	143.3
82	350.1	281.6	236.0	203.5	179.1	160.2	145.1
83	354.7	285.3	239.1	206.1	181.4	162.3	147.0
84	359.3	289.0	242.2	208.8	183.8	164.4	148.9
85	363.9	292.7	245.2	211.4	186.1	166.4	150.8
86	368.5	296.4	248.3	214.1	188.4	168.5	152.6
87	373.1	300.1	251.4	216.7	190.8	170.6	154.5
88	377.7	303.8	254.5	219.4	193.1	172.7	156.4
89	382.3	307.5	257.6	222.0	195.4	174.8	158.3
90	386.9	311.2	260.7	224.7	197.7	176.8	160.1
91	391.5	314.9	263.8	227.4	200.1	178.9	162.0
92	396.2	318.6	266.9	230.0	202.4	181.0	163.9
93	400.8	322.3	270.0	232.7	204.7	183.1	165.8
94	405.4	326.0	273.1	235.3	207.1	185.2	167.7
95	410.0	329.7	276.2	238.0	209.4	187.2	169.5
96	414.6	333.4	279.3	240.7	211.8	189.3	171.4
97	419.3	337.1	282.4	243.3	214.1	191.4	173.3
98	423.9	340.8	285.5	246.0	216.4	193.5	175.2
99	428.5	344.5	288.6	248.7	218.8	195.6	177.1
100	433.2	348.2	291.7	251.3	221.1	197.7	179.0

100p

c	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
0	25.30	2.519	1.253	0.4935	0.3488	0.2402	0.1557	0.1134
1	242.5	24.60	12.50	5.250	3.877	2.856	2.078	1.703
2	619.3	62.56	31.63	13.09	9.570	6.937	4.907	3.910
3	1090	109.9	55.46	22.78	16.56	11.91	8.319	6.539
4	1624	163.5	82.37	33.69	24.42	17.49	12.11	9.450
5	2203	221.5	111.5	45.47	32.90	23.49	16.18	12.56
6	2815	283.0	142.3	57.91	41.85	29.81	20.47	15.82
7	3455	347.1	174.4	70.88	51.16	36.39	24.92	19.21
8	4117	413.4	207.7	84.29	60.79	43.18	29.50	22.69
9	4797	481.6	241.8	98.05	70.66	50.14	34.20	26.26
10	5493	551.3	276.8	112.1	80.76	57.25	39.00	29.90
11	6202	622.4	312.4	126.4	91.04	64.50	43.88	33.60
12	6924	694.7	348.6	141.0	101.4	71.85	48.83	37.35
13	7656	768.0	385.3	155.8	112.0	79.31	53.85	41.15
14	8398	842.3	422.5	170.7	122.8	86.86	58.93	45.00
15	9148	917.4	460.2	185.8	133.6	94.48	64.06	48.88
16	9906	993.3	498.2	201.1	144.5	102.1	69.24	52.79
17	10670	1069	536.5	216.5	155.6	109.9	74.46	56.74
18	11440	1147	575.2	232.1	166.7	117.7	79.72	60.72
19	12210	1225	614.2	247.7	177.9	125.6	85.01	64.72
20	13000	1303	653.4	263.5	189.2	133.6	90.35	68.75
21	13790	1382	692.9	279.4	200.6	141.6	95.71	72.80
22	14580	1461	732.7	295.3	212.0	149.6	101.1	76.87
23	15380	1541	772.6	311.4	223.5	157.7	106.5	80.97
24	16180	1621	812.8	327.5	235.1	165.8	111.9	85.08
25	16980	1702	853.2	343.7	246.7	173.9	117.4	89.21
26	17790	1783	893.7	360.0	258.3	182.1	122.9	93.36
27	18600	1864	934.5	376.3	270.0	190.3	128.4	97.52
28	19420	1946	975.4	392.7	281.8	198.6	133.9	101.6
29	20240	2028	1016	409.2	293.6	206.9	139.5	105.8
30	21060	2110	1057	425.7	305.4	215.2	145.1	110.0
31	21890	2193	1098	442.3	317.3	223.5	150.7	114.3
32	22720	2276	1140	459.0	329.2	231.9	156.3	118.5
33	23550	2359	1182	475.7	341.2	240.3	161.9	122.7
34	24380	2442	1223	492.4	353.1	248.7	167.5	127.0
35	25210	2526	1265	509.2	365.2	257.1	173.2	131.2
36	26050	2610	1307	526.0	377.2	265.6	178.8	135.5
37	26890	2694	1349	542.9	389.3	274.1	184.5	139.8
38	27730	2778	1391	559.8	401.4	282.6	190.2	144.1
39	28580	2862	1434	576.8	413.5	291.1	195.9	148.4
40	29420	2947	1476	593.8	425.7	299.6	201.6	152.7
41	30270	3032	1518	610.8	437.9	308.2	207.4	157.0
42	31120	3117	1561	627.9	450.1	316.8	213.1	161.4
43	31970	3202	1604	645.0	462.3	325.3	218.9	165.7
44	32820	3287	1646	662.1	474.6	333.9	224.6	170.0
45	33680	3373	1689	679.3	486.8	342.6	230.4	174.4
46	34530	3459	1732	696.4	499.1	351.2	236.2	178.7
47	35390	3544	1775	713.7	511.5	359.8	242.0	183.1
48	36250	3630	1818	730.9	523.8	368.5	247.8	187.5
49	37110	3717	1861	748.2	536.2	377.2	253.6	191.8
50	37970	3803	1904	765.5	548.6	385.9	259.4	196.2

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
0	0.1134	0.08800	0.07098	0.05877	0.04956	0.04234	0.03652
1	1.703	1.488	1.353	1.263	1.200	1.155	1.121
2	3.910	3.327	2.952	2.696	2.515	2.384	2.287
3	6.539	5.488	4.803	4.328	3.986	3.733	3.543
4	9.450	7.868	6.830	6.104	5.575	5.179	4.878
5	12.56	10.40	8.983	7.985	7.253	6.700	6.275
6	15.82	13.05	11.23	9.945	8.998	8.279	7.721
7	19.21	15.80	13.55	11.96	10.79	9.902	9.206
8	22.69	18.63	15.94	14.04	12.63	11.56	10.72
9	26.26	21.52	18.38	16.16	14.51	13.25	12.26
10	29.90	24.46	20.86	18.31	16.42	14.97	13.83
11	33.60	27.46	23.38	20.50	18.36	16.71	15.42
12	37.35	30.49	25.94	22.71	20.31	18.47	17.02
13	41.15	33.56	28.52	24.95	22.29	20.25	18.64
14	45.00	36.66	31.14	27.21	24.29	22.05	20.27
15	48.88	39.80	33.77	29.49	26.31	23.85	21.92
16	52.79	42.96	36.43	31.79	28.34	25.68	23.57
17	56.74	46.14	39.11	34.11	30.38	27.51	25.24
18	60.72	49.35	41.80	36.43	32.44	29.35	26.92
19	64.72	52.58	44.51	38.78	34.50	31.21	28.60
20	68.75	55.83	47.24	41.13	36.58	33.07	30.29
21	72.80	59.09	49.98	43.50	38.67	34.94	31.99
22	76.87	62.37	52.74	45.88	40.77	36.82	33.70
23	80.97	65.67	55.50	48.27	42.88	38.71	35.41
24	85.08	68.98	58.28	50.67	44.99	40.61	37.13
25	89.21	72.31	61.07	53.08	47.12	42.51	38.85
26	93.36	75.65	63.87	55.50	49.24	44.41	40.58
27	97.52	79.00	66.68	57.92	51.38	46.33	42.32
28	101.6	82.36	69.50	60.35	53.52	48.25	44.06
29	105.8	85.73	72.33	62.79	55.67	50.17	45.80
30	110.0	89.12	75.17	65.24	57.83	52.10	47.55
31	114.3	92.51	78.01	67.70	59.99	54.03	49.30
32	118.5	95.91	80.87	70.16	62.16	55.97	51.05
33	122.7	99.32	83.73	72.62	64.33	57.91	52.81
34	127.0	102.7	86.59	75.09	66.50	59.86	54.58
35	131.2	106.1	89.47	77.57	68.68	61.81	56.34
36	135.5	109.6	92.35	80.05	70.87	63.76	58.11
37	139.8	113.0	95.23	82.54	73.06	65.72	59.89
38	144.1	116.5	98.12	85.03	75.25	67.68	61.66
39	148.4	119.9	101.0	87.53	77.45	69.65	63.44
40	152.7	123.4	103.9	90.03	79.65	71.61	65.22
41	157.0	126.9	106.8	92.54	81.85	73.58	67.01
42	161.4	130.3	109.7	95.05	84.06	75.56	68.79
43	165.7	133.8	112.6	97.56	86.27	77.53	70.58
44	170.0	137.3	115.5	100.0	88.49	79.51	72.37
45	174.4	140.8	118.5	102.6	90.71	81.50	74.17
46	178.7	144.3	121.4	105.1	92.93	83.48	75.97
47	183.1	147.8	124.3	107.6	95.15	85.47	77.76
48	187.5	151.3	127.3	110.1	97.38	87.46	79.56
49	191.8	154.8	130.2	112.7	99.61	89.45	81.37
50	196.2	158.4	133.2	115.2	101.8	91.44	83.17

Table of n satisfying the equation B(c,n,p)= 0.975

100p

c	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
51	38840	3889	1947	782.8	561.0	394.6	265.2	200.6
52	39700	3976	1991	800.2	573.4	403.3	271.1	205.0
53	40570	4062	2034	817.6	585.8	412.0	276.9	209.4
54	41430	4149	2077	835.0	598.3	420.8	282.8	213.8
55	42300	4236	2121	852.4	610.7	429.5	288.6	218.2
56	43170	4323	2165	869.9	623.2	438.3	294.5	222.6
57	44040	4410	2208	887.4	635.7	447.0	300.3	227.1
58	44910	4497	2252	904.9	648.3	455.8	306.2	231.5
59	45790	4585	2295	922.4	660.8	464.6	312.1	235.9
60	46660	4672	2339	939.9	673.3	473.4	318.0	240.4
61	47540	4760	2383	957.5	685.9	482.2	323.9	244.8
62	48410	4847	2427	975.1	698.5	491.1	329.8	249.2
63	49290	4935	2471	992.7	711.1	499.9	335.7	253.7
64	50170	5023	2515	1010	723.7	508.7	341.6	258.1
65	51050	5111	2559	1027	736.3	517.6	347.5	262.6
66	51930	5199	2603	1045	748.9	526.4	353.5	267.1
67	52810	5287	2647	1063	761.5	535.3	359.4	271.5
68	53690	5375	2691	1080	774.2	544.2	365.3	276.0
69	54570	5464	2735	1098	786.9	553.1	371.3	280.5
70	55450	5552	2779	1116	799.5	562.0	377.2	284.9
71	56340	5640	2824	1134	812.2	570.9	383.2	289.4
72	57220	5729	2868	1151	824.9	579.8	389.2	293.9
73	58110	5818	2912	1169	837.6	588.7	395.1	298.4
74	58990	5906	2957	1187	850.4	597.6	401.1	302.9
75	59880	5995	3001	1205	863.1	606.5	407.1	307.4
76	60770	6084	3046	1223	875.8	615.5	413.0	311.9
77	61660	6173	3090	1240	888.6	624.4	419.0	316.4
78	62550	6262	3135	1258	901.3	633.4	425.0	320.9
79	63440	6351	3179	1276	914.1	642.3	431.0	325.4
80	64330	6440	3224	1294	926.9	651.3	437.0	329.9
81	65220	6529	3268	1312	939.7	660.2	443.0	334.4
82	66110	6618	3313	1330	952.5	669.2	449.0	338.9
83	67000	6708	3358	1348	965.3	678.2	455.0	343.5
84	67900	6797	3402	1366	978.1	687.2	461.0	348.0
85	68790	6886	3447	1383	990.9	696.2	467.0	352.5
86	69690	6976	3492	1401	1003	705.2	473.0	357.0
87	70580	7066	3537	1419	1016	714.2	479.1	361.6
88	71480	7155	3582	1437	1029	723.2	485.1	366.1
89	72370	7245	3626	1455	1042	732.2	491.1	370.6
90	73270	7335	3671	1473	1055	741.2	497.1	375.2
91	74170	7424	3716	1491	1068	750.3	503.2	379.7
92	75070	7514	3761	1509	1080	759.3	509.2	384.3
93	75960	7604	3806	1527	1093	768.3	515.3	388.8
94	76860	7694	3851	1545	1106	777.4	521.3	393.4
95	77760	7784	3896	1563	1119	786.4	527.4	397.9
96	78660	7874	3941	1582	1132	795.5	533.4	402.5
97	79560	7964	3986	1600	1145	804.5	539.5	407.0
98	80470	8055	4031	1618	1158	813.6	545.5	411.6
99	81370	8145	4077	1636	1171	822.7	551.6	416.1
100	82270	8235	4122	1654	1184	831.7	557.7	420.7

Table of n satisfying the equation $B(c,n,p) = 0.95$

c	100p = 20.0	25.0	30.0	35.0	40.0	45.0	50.0
51	200.6	161.9	136.1	117.8	104.0	93.44	84.98
52	205.0	165.4	139.1	120.3	106.3	95.44	86.79
53	209.4	169.0	142.0	122.9	108.5	97.44	88.60
54	213.8	172.5	145.0	125.4	110.8	99.44	90.41
55	218.2	176.0	148.0	128.0	113.0	101.4	92.22
56	222.6	179.6	150.9	130.5	115.2	103.4	94.04
57	227.1	183.1	153.9	133.1	117.5	105.4	95.85
58	231.5	186.7	156.9	135.6	119.7	107.4	97.67
59	235.9	190.3	159.9	138.2	122.0	109.4	99.49
60	240.4	193.8	162.8	140.8	124.3	111.5	101.3
61	244.8	197.4	165.8	143.3	126.5	113.5	103.1
62	249.2	201.0	168.8	145.9	128.8	115.5	104.9
63	253.7	204.5	171.8	148.5	131.0	117.5	106.7
64	258.1	208.1	174.8	151.1	133.3	119.5	108.6
65	262.6	211.7	177.8	153.6	135.6	121.6	110.4
66	267.1	215.3	180.8	156.2	137.8	123.6	112.2
67	271.5	218.9	183.8	158.8	140.1	125.6	114.1
68	276.0	222.4	186.8	161.4	142.4	127.6	115.9
69	280.5	226.0	189.8	164.0	144.6	129.7	117.7
70	284.9	229.6	192.8	166.6	146.9	131.7	119.6
71	289.4	233.2	195.8	169.1	149.2	133.7	121.4
72	293.9	236.8	198.8	171.7	151.5	135.7	123.2
73	298.4	240.4	201.8	174.3	153.7	137.8	125.1
74	302.9	244.0	204.9	176.9	156.0	139.8	126.9
75	307.4	247.6	207.9	179.5	158.3	141.9	128.7
76	311.9	251.3	210.9	182.1	160.6	143.9	130.6
77	316.4	254.9	213.9	184.7	162.9	145.9	132.4
78	320.9	258.5	216.9	187.3	165.2	148.0	134.3
79	325.4	262.1	220.0	189.9	167.4	150.0	136.1
80	329.9	265.7	223.0	192.5	169.7	152.1	138.0
81	334.4	269.4	226.0	195.1	172.0	154.1	139.8
82	338.9	273.0	229.1	197.7	174.3	156.1	141.7
83	343.5	276.6	232.1	200.4	176.6	158.2	143.5
84	348.0	280.2	235.1	203.0	178.9	160.2	145.4
85	352.5	283.9	238.2	205.6	181.2	162.3	147.2
86	357.0	287.5	241.2	208.2	183.5	164.3	149.1
87	361.6	291.1	244.2	210.8	185.8	166.4	150.9
88	366.1	294.8	247.3	213.4	188.1	168.4	152.8
89	370.6	298.4	250.3	216.0	190.4	170.5	154.6
90	375.2	302.1	253.4	218.7	192.7	172.5	156.5
91	379.7	305.7	256.4	221.3	195.0	174.6	158.3
92	384.3	309.4	259.5	223.9	197.3	176.6	160.2
93	388.8	313.0	262.5	226.5	199.6	178.7	162.0
94	393.4	316.7	265.6	229.2	201.9	180.7	163.9
95	397.9	320.3	268.6	231.8	204.2	182.8	165.7
96	402.5	324.0	271.7	234.4	206.5	184.9	167.6
97	407.0	327.6	274.7	237.0	208.8	186.9	169.5
98	411.6	331.3	277.8	239.7	211.1	189.0	171.3
99	416.1	334.9	280.9	242.3	213.4	191.0	173.2
100	420.7	338.6	283.9	244.9	215.7	193.1	175.0

100p

c	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
0	10.04	1.000	0.4974	0.1959	0.1384	0.09538	0.06184	0.04503
1	148.9	15.28	7.871	3.441	2.610	2.000	1.547	1.339
2	436.8	44.39	22.60	9.544	7.070	5.227	3.820	3.141
3	824.3	83.42	42.26	17.59	12.90	9.406	6.709	5.386
4	1280	129.2	65.33	26.98	19.69	14.24	10.02	7.943
5	1786	180.1	90.88	37.35	27.17	19.55	13.65	10.72
6	2332	234.8	118.3	48.48	35.18	25.23	17.51	13.68
7	2908	292.6	147.3	60.21	43.63	31.20	21.57	16.79
8	3509	353.0	177.6	72.44	52.42	37.42	25.79	20.00
9	4132	415.4	208.9	85.09	61.51	43.84	30.13	23.31
10	4773	479.7	241.1	98.09	70.85	50.43	34.59	26.70
11	5430	545.6	274.2	111.4	80.41	57.18	39.15	30.17
12	6102	612.8	307.9	124.9	90.16	64.06	43.79	33.69
13	6785	681.3	342.2	138.8	100.0	71.05	48.51	37.28
14	7479	750.9	377.1	152.8	110.1	78.15	53.30	40.91
15	8184	821.5	412.4	167.0	120.3	85.35	58.15	44.59
16	8898	893.0	448.3	181.5	130.7	92.63	63.05	48.30
17	9620	965.3	484.5	196.0	141.1	99.99	68.01	52.06
18	10340	1038	521.1	210.8	151.7	107.4	73.01	55.85
19	11080	1112	558.0	225.6	162.3	114.9	78.06	59.67
20	11820	1186	595.3	240.6	173.1	122.4	83.14	63.52
21	12570	1261	632.9	255.7	183.9	130.1	88.27	67.40
22	13330	1337	670.7	270.9	194.8	137.7	93.42	71.30
23	14090	1413	708.9	286.3	205.8	145.4	98.62	75.22
24	14850	1489	747.2	301.7	216.8	153.2	103.8	79.17
25	15620	1566	785.8	317.2	227.9	161.0	109.0	83.14
26	16400	1644	824.6	332.8	239.1	168.9	114.3	87.13
27	17170	1722	863.6	348.4	250.3	176.8	119.6	91.14
28	17960	1800	902.8	364.2	261.6	184.7	124.9	95.16
29	18740	1879	942.2	380.0	272.9	192.7	130.3	99.20
30	19530	1958	981.8	395.9	284.3	200.7	135.7	103.2
31	20320	2037	1021	411.9	295.8	208.7	141.1	107.3
32	21120	2117	1061	427.9	307.2	216.8	146.5	111.4
33	21920	2197	1101	444.0	318.7	224.9	151.9	115.5
34	22720	2277	1141	460.1	330.3	233.0	157.3	119.6
35	23530	2358	1182	476.3	341.9	241.1	162.8	123.7
36	24330	2439	1222	492.5	353.5	249.3	168.3	127.9
37	25140	2520	1263	508.8	365.2	257.5	173.8	132.0
38	25960	2601	1303	525.2	376.9	265.7	179.3	136.2
39	26770	2683	1344	541.6	388.6	274.0	184.8	140.3
40	27590	2764	1385	558.0	400.4	282.2	190.4	144.5
41	28410	2846	1426	574.5	412.2	290.5	195.9	148.7
42	29230	2929	1467	591.0	424.0	298.8	201.5	152.9
43	30050	3011	1509	607.6	435.9	307.1	207.1	157.1
44	30880	3094	1550	624.2	447.8	315.5	212.7	161.3
45	31710	3177	1591	640.8	459.7	323.9	218.3	165.6
46	32540	3260	1633	657.5	471.6	332.2	223.9	169.8
47	33370	3343	1675	674.2	483.6	340.6	229.5	174.0
48	34200	3426	1716	690.9	495.5	349.0	235.2	178.3
49	35030	3510	1758	707.7	507.5	357.5	240.8	182.6
50	35870	3593	1800	724.5	519.6	365.9	246.5	186.8

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
0	0.04503	0.03493	0.02817	0.02333	0.01967	0.01681	0.01449
1	1.339	1.225	1.158	1.114	1.085	1.065	1.050
2	3.141	2.754	2.514	2.357	2.252	2.180	2.130
3	5.386	4.615	4.122	3.788	3.556	3.392	3.275
4	7.943	6.719	5.924	5.377	4.987	4.703	4.496
5	10.72	9.000	7.871	7.085	6.518	6.098	5.784
6	13.68	11.41	9.928	8.886	8.127	7.559	7.128
7	16.79	13.94	12.07	10.76	9.798	9.074	8.518
8	20.00	16.56	14.29	12.69	11.52	10.63	9.946
9	23.31	19.25	16.56	14.67	13.28	12.22	11.40
10	26.70	22.00	18.89	16.70	15.08	13.85	12.89
11	30.17	24.81	21.27	18.76	16.91	15.50	14.40
12	33.69	27.67	23.68	20.86	18.77	17.18	15.93
13	37.28	30.57	26.13	22.99	20.66	18.87	17.48
14	40.91	33.51	28.61	25.14	22.56	20.59	19.04
15	44.59	36.49	31.12	27.31	24.49	22.32	20.62
16	48.30	39.49	33.65	29.51	26.43	24.07	22.21
17	52.06	42.53	36.21	31.72	28.39	25.83	23.82
18	55.85	45.59	38.78	33.96	30.37	27.61	25.43
19	59.67	48.68	41.38	36.20	32.36	29.39	27.06
20	63.52	51.78	44.00	38.47	34.36	31.19	28.69
21	67.40	54.91	46.63	40.75	36.37	33.00	30.34
22	71.30	58.06	49.28	43.04	38.39	34.82	31.99
23	75.22	61.23	51.94	45.34	40.43	36.64	33.65
24	79.17	64.42	54.62	47.66	42.47	38.47	35.32
25	83.14	67.62	57.31	49.98	44.52	40.32	36.99
26	87.13	70.83	60.01	52.32	46.59	42.16	38.67
27	91.14	74.06	62.72	54.66	48.65	44.02	40.35
28	95.16	77.31	65.45	57.02	50.73	45.88	42.04
29	99.20	80.57	68.18	59.38	52.82	47.75	43.74
30	103.2	83.84	70.93	61.75	54.91	49.63	45.44
31	107.3	87.12	73.68	64.13	57.01	51.50	47.15
32	111.4	90.41	76.45	66.52	59.11	53.39	48.86
33	115.5	93.71	79.22	68.91	61.22	55.28	50.57
34	119.6	97.03	82.00	71.31	63.34	57.18	52.29
35	123.7	100.3	84.79	73.72	65.46	59.08	54.01
36	127.9	103.6	87.58	76.13	67.58	60.98	55.74
37	132.0	107.0	90.39	78.55	69.71	62.89	57.47
38	136.2	110.3	93.20	80.97	71.85	64.80	59.21
39	140.3	113.7	96.01	83.40	73.99	66.72	60.94
40	144.5	117.1	98.84	85.84	76.14	68.64	62.68
41	148.7	120.4	101.6	88.28	78.29	70.56	64.43
42	152.9	123.8	104.5	90.73	80.44	72.49	66.18
43	157.1	127.2	107.3	93.18	82.60	74.42	67.93
44	161.3	130.6	110.1	95.63	84.76	76.35	69.68
45	165.6	134.0	113.0	98.09	86.93	78.29	71.43
46	169.8	137.4	115.9	100.5	89.10	80.23	73.19
47	174.0	140.8	118.7	103.0	91.27	82.18	74.95
48	178.3	144.2	121.6	105.4	93.44	84.12	76.72
49	182.6	147.7	124.5	107.9	95.62	86.07	78.48
50	186.8	151.1	127.3	110.4	97.81	88.02	80.25

Table of n satisfying the equation B(c,n,p)= 0.990

c	100p 0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
51	36710	3677	1842	741.3	531.6	374.4	252.2	191.1
52	37550	3761	1884	758.2	543.7	382.9	257.8	195.4
53	38390	3845	1926	775.1	555.8	391.4	263.5	199.7
54	39230	3930	1968	792.0	567.9	399.9	269.2	204.0
55	40080	4014	2011	809.0	580.0	408.4	274.9	208.3
56	40920	4099	2053	826.0	592.2	416.9	280.6	212.6
57	41770	4184	2095	843.0	604.4	425.4	286.4	216.9
58	42620	4268	2138	860.0	616.6	434.0	292.1	221.2
59	43460	4353	2180	877.1	628.8	442.6	297.8	225.5
60	44310	4439	2223	894.2	641.0	451.2	303.6	229.9
61	45170	4524	2265	911.3	653.2	459.7	309.3	234.2
62	46020	4609	2308	928.4	665.5	468.4	315.1	238.5
63	46870	4695	2351	945.5	677.8	477.0	320.9	242.9
64	47730	4780	2394	962.7	690.1	485.6	326.6	247.2
65	48580	4866	2437	979.9	702.4	494.2	332.4	251.6
66	49440	4952	2480	997.1	714.7	502.9	338.2	256.0
67	50300	5038	2523	1014	727.0	511.5	344.0	260.3
68	51160	5124	2566	1031	739.4	520.2	349.8	264.7
69	52020	5210	2609	1048	751.7	528.9	355.6	269.1
70	52880	5296	2652	1066	764.1	537.6	361.4	273.5
71	53740	5382	2695	1083	776.5	546.3	367.3	277.8
72	54610	5469	2738	1100	788.9	555.0	373.1	282.2
73	55470	5555	2782	1118	801.3	563.7	378.9	286.6
74	56340	5642	2825	1135	813.7	572.4	384.8	291.0
75	57200	5728	2868	1153	826.2	581.1	390.6	295.4
76	58070	5815	2912	1170	838.6	589.9	396.4	299.8
77	58940	5902	2955	1187	851.1	598.6	402.3	304.2
78	59810	5989	2999	1205	863.6	607.4	408.2	308.6
79	60680	6076	3042	1222	876.1	616.1	414.0	313.1
80	61550	6163	3086	1240	888.6	624.9	419.9	317.5
81	62420	6250	3130	1257	901.1	633.7	425.8	321.9
82	63290	6337	3173	1275	913.6	642.4	431.6	326.3
83	64160	6425	3217	1292	926.1	651.2	437.5	330.8
84	65040	6512	3261	1310	938.7	660.0	443.4	335.2
85	65910	6600	3304	1327	951.2	668.8	449.3	339.6
86	66790	6687	3348	1345	963.8	677.7	455.2	344.1
87	67660	6775	3392	1362	976.3	686.5	461.1	348.5
88	68540	6863	3436	1380	988.9	695.3	467.0	353.0
89	69410	6950	3480	1398	1001	704.1	472.9	357.4
90	70290	7038	3524	1415	1014	713.0	478.8	361.9
91	71170	7126	3568	1433	1026	721.8	484.8	366.3
92	72050	7214	3612	1451	1039	730.7	490.7	370.8
93	72930	7302	3656	1468	1052	739.5	496.6	375.2
94	73810	7390	3700	1486	1064	748.4	502.5	379.7
95	74690	7478	3744	1504	1077	757.3	508.5	384.2
96	75570	7567	3788	1521	1089	766.1	514.4	388.6
97	76460	7655	3832	1539	1102	775.0	520.4	393.1
98	77340	7743	3877	1557	1115	783.9	526.3	397.6
99	78220	7832	3921	1574	1127	792.8	532.3	402.1
100	79110	7920	3965	1592	1140	801.7	538.2	406.6

Table of n satisfying the equation B(c,n,p)= 0.990

	100p						
c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
51	191.1	154.5	130.2	112.9	99.99	89.98	82.02
52	195.4	158.0	133.1	115.4	102.1	91.94	83.79
53	199.7	161.4	136.0	117.9	104.3	93.90	85.57
54	204.0	164.9	138.9	120.4	106.5	95.86	87.34
55	208.3	168.3	141.8	122.9	108.7	97.82	89.12
56	212.6	171.8	144.7	125.4	110.9	99.79	90.90
57	216.9	175.3	147.6	127.9	113.1	101.7	92.69
58	221.2	178.7	150.5	130.4	115.3	103.7	94.47
59	225.5	182.2	153.4	132.9	117.5	105.7	96.26
60	229.9	185.7	156.3	135.4	119.7	107.6	98.05
61	234.2	189.2	159.2	137.9	122.0	109.6	99.84
62	238.5	192.7	162.2	140.4	124.2	111.6	101.6
63	242.9	196.2	165.1	142.9	126.4	113.6	103.4
64	247.2	199.7	168.0	145.5	128.6	115.6	105.2
65	251.6	203.2	171.0	148.0	130.8	117.5	107.0
66	256.0	206.7	173.9	150.5	133.1	119.5	108.8
67	260.3	210.2	176.8	153.1	135.3	121.5	110.6
68	264.7	213.7	179.8	155.6	137.5	123.5	112.4
69	269.1	217.2	182.7	158.1	139.7	125.5	114.2
70	273.5	220.7	185.7	160.7	142.0	127.5	116.0
71	277.8	224.3	188.6	163.2	144.2	129.5	117.8
72	282.2	227.8	191.6	165.7	146.4	131.5	119.6
73	286.6	231.3	194.5	168.3	148.7	133.5	121.4
74	291.0	234.8	197.5	170.8	150.9	135.5	123.2
75	295.4	238.4	200.4	173.4	153.2	137.5	125.0
76	299.8	241.9	203.4	175.9	155.4	139.5	126.8
77	304.2	245.5	206.4	178.5	157.6	141.5	128.6
78	308.6	249.0	209.3	181.0	159.9	143.5	130.4
79	313.1	252.6	212.3	183.6	162.1	145.5	132.3
80	317.5	256.1	215.3	186.2	164.4	147.5	134.1
81	321.9	259.7	218.2	188.7	166.6	149.5	135.9
82	326.3	263.2	221.2	191.3	168.9	151.5	137.7
83	330.8	266.8	224.2	193.8	171.1	153.5	139.5
84	335.2	270.3	227.2	196.4	173.4	155.6	141.4
85	339.6	273.9	230.2	199.0	175.6	157.6	143.2
86	344.1	277.5	233.1	201.5	177.9	159.6	145.0
87	348.5	281.0	236.1	204.1	180.2	161.6	146.8
88	353.0	284.6	239.1	206.7	182.4	163.6	148.7
89	357.4	288.2	242.1	209.3	184.7	165.6	150.5
90	361.9	291.8	245.1	211.8	186.9	167.7	152.3
91	366.3	295.3	248.1	214.4	189.2	169.7	154.1
92	370.8	298.9	251.1	217.0	191.5	171.7	156.0
93	375.2	302.5	254.1	219.6	193.7	173.7	157.8
94	379.7	306.1	257.1	222.1	196.0	175.8	159.6
95	384.2	309.7	260.1	224.7	198.3	177.8	161.5
96	388.6	313.3	263.1	227.3	200.6	179.8	163.3
97	393.1	316.9	266.1	229.9	202.8	181.8	165.1
98	397.6	320.5	269.1	232.5	205.1	183.9	167.0
99	402.1	324.0	272.1	235.1	207.4	185.9	168.8
100	406.6	327.6	275.1	237.7	209.6	187.9	170.6

Table of n satisfying the equation B(c,n,p)= 0.995

c	100p 0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
0	5.010	0.4987	0.2481	0.09772	0.06907	0.04757	0.03084	0.02246
1	103.9	10.81	5.647	2.580	2.013	1.605	1.314	1.187
2	338.6	34.62	17.74	7.641	5.733	4.319	3.251	2.748
3	673.3	68.39	34.79	14.65	10.83	7.991	5.807	4.747
4	1079	109.2	55.37	23.07	16.93	12.34	8.810	7.075
5	1538	155.4	78.59	32.52	23.76	17.20	12.14	9.646
6	2039	205.7	103.8	42.78	31.16	22.46	15.73	12.40
7	2573	259.3	130.7	53.69	39.02	28.04	19.53	15.31
8	3134	315.6	159.0	65.14	47.26	33.87	23.50	18.34
9	3719	374.3	188.5	77.04	55.82	39.93	27.61	21.48
10	4324	434.9	218.9	89.32	64.66	46.18	31.84	24.71
11	4946	497.3	250.2	101.9	73.73	52.59	36.18	28.02
12	5583	561.2	282.2	114.8	83.01	59.14	40.62	31.39
13	6234	626.4	314.9	128.0	92.49	65.83	45.13	34.83
14	6896	692.8	348.2	141.4	102.1	72.63	49.73	38.32
15	7570	760.4	382.0	155.1	111.9	79.53	54.39	41.86
16	8254	828.9	416.4	168.9	121.8	86.53	59.11	45.44
17	8947	898.3	451.2	182.9	131.8	93.61	63.88	49.07
18	9648	968.6	486.4	197.1	142.0	100.7	68.71	52.73
19	10350	1039	522.0	211.4	152.3	108.0	73.59	56.43
20	11070	1111	557.9	225.9	162.7	115.3	78.51	60.16
21	11790	1183	594.2	240.5	173.1	122.6	83.47	63.91
22	12520	1256	630.8	255.2	183.7	130.1	88.47	67.70
23	13260	1330	667.6	270.0	194.3	137.5	93.51	71.51
24	14000	1404	704.8	284.9	205.0	145.1	98.57	75.35
25	14740	1479	742.1	300.0	215.8	152.7	103.6	79.21
26	15490	1554	779.8	315.1	226.6	160.3	108.8	83.09
27	16250	1629	817.6	330.3	237.5	168.0	113.9	87.00
28	17000	1705	855.7	345.6	248.5	175.7	119.1	90.92
29	17770	1782	894.0	361.0	259.5	183.4	124.3	94.86
30	18530	1859	932.4	376.5	270.6	191.2	129.5	98.81
31	19310	1936	971.1	392.0	281.7	199.0	134.8	102.7
32	20080	2013	1009	407.6	292.9	206.9	140.1	106.7
33	20860	2091	1048	423.3	304.1	214.8	145.4	110.7
34	21640	2169	1088	439.0	315.4	222.7	150.7	114.8
35	22420	2248	1127	454.8	326.7	230.7	156.0	118.8
36	23210	2327	1166	470.6	338.0	238.6	161.4	122.8
37	24000	2406	1206	486.5	349.4	246.6	166.8	126.9
38	24790	2485	1246	502.5	360.9	254.7	172.2	131.0
39	25590	2565	1286	518.5	372.3	262.7	177.6	135.1
40	26390	2645	1326	534.5	383.8	270.8	183.0	139.1
41	27190	2725	1366	550.6	395.4	278.9	188.4	143.3
42	27990	2805	1406	566.8	406.9	287.0	193.9	147.4
43	28790	2886	1446	583.0	418.5	295.2	199.4	151.5
44	29600	2967	1487	599.2	430.1	303.4	204.8	155.6
45	30410	3048	1527	615.5	441.8	311.6	210.3	159.8
46	31220	3129	1568	631.8	453.5	319.8	215.8	163.9
47	32030	3210	1609	648.2	465.2	328.0	221.3	168.1
48	32850	3292	1649	664.6	476.9	336.2	226.9	172.3
49	33670	3374	1690	681.0	488.7	344.5	232.4	176.5
50	34490	3456	1731	697.5	500.5	352.8	238.0	180.6

Table of n satisfying the equation B(c,n,p)= 0.995

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
0	0.02246	0.01742	0.01405	0.01163	0.009812	0.008384	0.007231
1	1.187	1.121	1.083	1.059	1.043	1.033	1.025
2	2.748	2.472	2.307	2.205	2.140	2.097	2.068
3	4.747	4.139	3.759	3.510	3.343	3.231	3.156
4	7.075	6.062	5.413	4.974	4.669	4.455	4.305
5	9.646	8.175	7.222	6.567	6.101	5.765	5.520
6	12.40	10.43	9.151	8.261	7.619	7.146	6.795
7	15.31	12.81	11.17	10.03	9.204	8.586	8.121
8	18.34	15.29	13.28	11.87	10.84	10.07	9.488
9	21.48	17.84	15.45	13.76	12.53	11.60	10.89
10	24.71	20.47	17.67	15.70	14.26	13.16	12.32
11	28.02	23.16	19.95	17.69	16.02	14.76	13.78
12	31.39	25.90	22.26	19.70	17.81	16.37	15.26
13	34.83	28.68	24.62	21.75	19.63	18.02	16.76
14	38.32	31.51	27.01	23.83	21.48	19.68	18.28
15	41.86	34.38	29.43	25.93	23.34	21.36	19.81
16	45.44	37.28	31.88	28.06	25.23	23.06	21.36
17	49.07	40.22	34.36	30.21	27.13	24.77	22.92
18	52.73	43.18	36.86	32.37	29.05	26.50	24.50
19	56.43	46.17	39.38	34.56	30.98	28.24	26.08
20	60.16	49.19	41.92	36.76	32.93	29.99	27.68
21	63.91	52.23	44.47	38.98	34.89	31.75	29.28
22	67.70	55.29	47.05	41.21	36.87	33.53	30.90
23	71.51	58.37	49.64	43.45	38.85	35.31	32.52
24	75.35	61.46	52.25	45.71	40.85	37.10	34.15
25	79.21	64.58	54.87	47.98	42.85	38.90	35.79
26	83.09	67.71	57.51	50.26	44.87	40.71	37.44
27	87.00	70.86	60.16	52.55	46.89	42.53	39.09
28	90.92	74.03	62.82	54.85	48.92	44.35	40.74
29	94.86	77.21	65.49	57.16	50.96	46.19	42.41
30	98.81	80.40	68.17	59.48	53.01	48.02	44.08
31	102.7	83.61	70.86	61.81	55.07	49.87	45.75
32	106.7	86.82	73.57	64.15	57.13	51.72	47.43
33	110.7	90.05	76.28	66.49	59.20	53.57	49.12
34	114.8	93.29	79.00	68.84	61.27	55.43	50.81
35	118.8	96.54	81.73	71.20	63.35	57.30	52.50
36	122.8	99.81	84.47	73.57	65.44	59.17	54.20
37	126.9	103.0	87.22	75.94	67.53	61.04	55.90
38	131.0	106.3	89.97	78.32	69.63	62.92	57.61
39	135.1	109.6	92.73	80.70	71.73	64.81	59.31
40	139.1	112.9	95.50	83.10	73.84	66.69	61.03
41	143.3	116.2	98.28	85.49	75.95	68.59	62.74
42	147.4	119.5	101.0	87.89	78.07	70.48	64.46
43	151.5	122.8	103.8	90.30	80.19	72.38	66.19
44	155.6	126.2	106.6	92.71	82.32	74.29	67.91
45	159.8	129.5	109.4	95.13	84.45	76.19	69.64
46	163.9	132.9	112.2	97.55	86.58	78.10	71.38
47	168.1	136.2	115.0	99.98	88.72	80.02	73.11
48	172.3	139.6	117.8	102.4	90.86	81.93	74.85
49	176.5	142.9	120.7	104.8	93.01	83.85	76.59
50	180.6	146.3	123.5	107.2	95.16	85.78	78.33

Table of n satisfying the equation B(c,n,p)= 0.995

100p

c	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
51	35310	3538	1773	714.0	512.3	361.1	243.5	184.8
52	36130	3620	1814	730.5	524.1	369.4	249.1	189.0
53	36950	3702	1855	747.1	536.0	377.7	254.7	193.3
54	37780	3785	1896	763.7	547.9	386.1	260.3	197.5
55	38610	3868	1938	780.3	559.8	394.4	265.9	201.7
56	39430	3951	1979	797.0	571.7	402.8	271.5	205.9
57	40260	4034	2021	813.7	583.7	411.2	277.1	210.2
58	41100	4117	2063	830.4	595.6	419.6	282.8	214.4
59	41930	4201	2104	847.1	607.6	428.0	288.4	218.7
60	42760	4284	2146	863.9	619.6	436.4	294.1	222.9
61	43600	4368	2188	880.7	631.6	444.9	299.7	227.2
62	44440	4452	2230	897.5.	643.7	453.3	305.4	231.5
63	45280	4536	2272	914.4	655.7	461.8	311.0	235.8
64	46120	4620	2314	931.3	667.8	470.3	316.7	240.0
65	46960	4704	2356	948.2	679.9	478.8	322.4	244.3
66	47800	4788	2398	965.1	692.0	487.3	328.1	248.6
67	48640	4872	2441	982.0	704.1	495.8	333.8	252.9
68	49490	4957	2483	999.0	716.3	504.3	339.5	257.2
69	50330	5042	2525	1016	728.4	512.8	345.2	261.5
70	51180	5126	2568	1033	740.6	521.4	351.0	265.8
71	52030	5211	2610	1050	752.8	529.9	356.7	270.2
72	52880	5296	2653	1067	765.0	538.5	362.4	274.5
73	53720	5381	2695	1084	777.2	547.1	368.2	278.8
74	54580	5466	2738	1101	789.5	555.7	373.9	283.1
75	55430	5552	2780	1118	801.7	564.3	379.7	287.5
76	56280	5637	2823	1135	814.0	572.9	385.4	291.8
77	57130	5723	2866	1152	826.2	581.5	391.2	296.2
78	57990	5808	2909	1169	838.5	590.1	397.0	300.5
79	58840	5894	2952	1187	850.8	598.7	402.8	304.9
80	59700	5979	2995	1204	863.1	607.4	408.6	309.2
81	60560	6065	3037	1221	875.4	616.0	414.3	313.6
82	61420	6151	3080	1238	887.8	624.7	420.1	318.0
83	62280	6237	3123	1255	900.1	633.3	425.9	322.3
84	63140	6323	3167	1273	912.5	642.0	431.7	326.7
85	64000	6409	3210	1290	924.8	650.7	437.6	331.1
86	64860	6495	3253	1307	937.2	659.4	443.4	335.5
87	65720	6582	3296	1325	949.6	668.1	449.2	339.8
88	66580	6668	3339	1342	962.0	676.8	455.0	344.2
89	67450	6755	3382	1359	974.4	685.5	460.8	348.6
90	68310	6841	3426	1377	986.8	694.2	466.7	353.0
91	69180	6928	3469	1394	999.3	702.9	472.5	357.4
92	70040	7014	3512	1411	1011	711.6	478.4	361.8
93	70910	7101	3556	1429	1024	720.4	484.2	366.2
94	71780	7188	3599	1446	1036	729.1	490.1	370.6
95	72650	7275	3643	1464	1049	737.9	495.9	375.0
96	73520	7362	3686	1481	1061	746.6	501.8	379.5
97	74390	7449	3730	1499	1074	755.4	507.6	383.9
98	75260	7536	3773	1516	1086	764.2	513.5	388.3
99	76130	7623	3817	1534	1099	772.9	519.4	392.7
100	77000	7710	3861	1551	1111	781.7	525.3	397.1

Table of n satisfying the equation B(c,n,p)= 0.995

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
51	184.8	149.7	126.3	109.7	97.31	87.70	80.08
52	189.0	153.1	129.2	112.1	99.46	89.63	81.83
53	193.3	156.5	132.0	114.6	101.6	91.56	83.58
54	197.5	159.9	134.8	117.0	103.7	93.50	85.33
55	201.7	163.3	137.7	119.5	105.9	95.44	87.09
56	205.9	166.7	140.6	122.0	108.1	97.38	88.84
57	210.2	170.1	143.4	124.4	110.2	99.32	90.60
58	214.4	173.5	146.3	126.9	112.4	101.2	92.37
59	218.7	176.9	149.1	129.4	114.6	103.2	94.13
60	222.9	180.3	152.0	131.8	116.8	105.1	95.89
61	227.2	183.8	154.9	134.3	119.0	107.1	97.66
62	231.5	187.2	157.8	136.8	121.1	109.0	99.43
63	235.8	190.7	160.7	139.3	123.3	111.0	101.2
64	240.0	194.1	163.5	141.8	125.5	112.9	102.9
65	244.3	197.5	166.4	144.3	127.7	114.9	104.7
66	248.6	201.0	169.3	146.8	129.9	116.9	106.5
67	252.9	204.5	172.2	149.3	132.1	118.8	108.3
68	257.2	207.9	175.1	151.8	134.3	120.8	110.0
69	261.5	211.4	178.0	154.3	136.5	122.7	111.8
70	265.8	214.8	180.9	156.8	138.7	124.7	113.6
71	270.2	218.3	183.8	159.3	140.9	126.7	115.4
72	274.5	221.8	186.7	161.8	143.1	128.7	117.2
73	278.8	225.3	189.7	164.3	145.3	130.6	119.0
74	[illegible]	228.8	192.6	166.8	147.5	132.6	120.7
75	[illegible]	232.2	195.5	169.3	149.7	134.6	122.5
76	291.8	235.7	198.4	171.8	152.0	136.6	124.3
77	296.2	239.2	201.3	174.3	154.2	138.6	126.1
78	300.5	242.7	204.3	176.9	156.4	140.5	127.9
79	304.9	246.2	207.2	179.4	158.6	142.5	129.7
80	309.2	249.7	210.1	181.9	160.8	144.5	131.5
81	313.6	253.2	213.1	184.5	163.1	146.5	133.3
82	318.0	256.7	216.0	187.0	165.3	148.5	135.1
83	322.3	260.3	218.9	189.5	167.5	150.5	136.9
84	326.7	263.8	221.9	192.0	169.7	152.5	138.7
85	331.1	267.3	224.8	194.6	172.0	154.5	140.5
86	335.5	270.8	227.8	197.1	174.2	156.4	142.3
87	339.8	274.3	230.7	199.7	176.4	158.4	144.1
88	344.2	277.9	233.7	202.2	178.7	160.4	145.9
89	348.6	281.4	236.6	204.7	180.9	162.4	147.7
90	353.0	284.9	239.6	207.3	183.1	164.4	149.5
91	357.4	288.4	242.5	209.8	185.4	166.4	151.4
92	361.8	292.0	245.5	212.4	187.6	168.4	153.2
93	366.2	295.5	248.5	214.9	189.9	170.4	155.0
94	370.6	299.1	251.4	217.5	192.1	172.4	156.8
95	375.0	302.6	254.4	220.0	194.4	174.4	158.6
96	379.5	306.2	257.4	222.6	196.6	176.5	160.4
97	383.9	309.7	260.3	225.2	198.8	178.5	162.2
98	388.3	313.3	263.3	227.7	201.1	180.5	164.0
99	392.7	316.8	266.3	230.3	203.3	182.5	165.9
100	397.1	320.4	269.3	232.8	205.6	184.5	167.7

Table of n satisfying the equation $B(c,n,p) = 0.999$

c	100p = 0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
0	1.000	0.09954	0.04952	0.01950	0.01378	0.009495	0.006156	0.004483
1	45.88	5.045	2.803	1.518	1.302	1.162	1.074	1.041
2	191.4	19.97	10.46	4.808	3.758	2.999	2.462	2.238
3	429.8	44.15	22.74	9.936	7.520	5.734	4.395	3.775
4	741.0	75.58	38.62	16.49	12.29	9.177	6.797	5.654
5	1109	112.6	57.33	24.16	17.86	13.16	9.560	7.803
6	1522	154.2	78.28	32.72	24.06	17.59	12.60	10.16
7	1973	199.6	101.0	42.00	30.77	22.37	15.89	12.69
8	2455	248.0	125.4	51.89	37.91	27.45	19.36	15.36
9	2963	299.0	151.0	62.30	45.42	32.78	23.00	18.16
10	3494	352.4	177.8	73.16	53.24	38.33	26.78	21.05
11	4045	407.7	205.6	84.40	61.34	44.07	30.68	24.04
12	4614	464.8	234.2	95.99	69.68	49.97	34.70	27.11
13	5199	523.4	263.7	107.8	78.24	56.03	38.81	30.25
14	5798	583.5	293.8	120.0	86.99	62.22	43.00	33.45
15	6409	644.8	324.5	132.4	95.92	68.53	47.28	36.71
16	7032	707.3	355.9	145.1	105.0	74.95	51.63	40.02
17	7666	770.8	387.8	158.0	114.2	81.48	56.04	43.39
18	8310	835.4	420.1	171.0	123.6	88.09	60.52	46.79
19	8963	900.8	452.9	184.2	133.1	94.80	65.05	50.23
20	9624	967.1	486.1	197.6	142.7	101.5	69.63	53.71
21	10290	1034	519.8	211.2	152.4	108.4	74.26	57.23
22	10960	1101	553.7	224.9	162.2	115.3	78.94	60.78
23	11650	1170	588.0	238.7	172.2	122.3	83.65	64.36
24	12340	1239	622.7	252.6	182.2	129.4	88.41	67.98
25	13030	1309	657.6	266.7	192.3	136.5	93.21	71.61
26	13730	1379	692.8	280.9	202.4	143.6	98.04	75.28
27	14440	1450	728.3	295.2	212.7	150.9	102.9	78.96
28	15150	1521	764.0	309.5	223.0	158.1	107.7	82.67
29	15870	1593	800.0	324.0	233.4	165.4	112.7	86.41
30	16590	1665	836.2	338.6	243.8	172.8	117.6	90.16
31	17320	1738	872.7	353.2	254.3	180.2	122.6	93.93
32	18050	1811	909.3	368.0	264.9	187.6	127.6	97.73
33	18780	1885	946.1	382.8	275.5	195.1	132.6	101.5
34	19520	1959	983.1	397.7	286.2	202.6	137.7	105.3
35	20260	2033	1020	412.6	296.9	210.2	142.8	109.2
36	21010	2108	1057	427.7	307.7	217.8	147.9	113.0
37	21760	2182	1095	442.8	318.5	225.4	153.0	116.9
38	22510	2258	1133	457.9	329.4	233.0	158.1	120.8
39	23260	2333	1170	473.1	340.3	240.7	163.3	124.7
40	24020	2409	1208	488.4	351.2	248.4	168.5	128.6
41	24780	2486	1247	503.8	362.2	256.1	173.7	132.5
42	25550	2562	1285	519.2	373.3	263.9	178.9	136.5
43	26310	2639	1323	534.6	384.3	271.7	184.1	140.4
44	27080	2716	1362	550.1	395.4	279.5	189.4	144.4
45	27850	2793	1401	565.6	406.6	287.3	194.6	148.4
46	28630	2871	1439	581.2	417.7	295.2	199.9	152.4
47	29400	2948	1478	596.9	428.9	303.0	205.2	156.4
48	30180	3026	1517	612.6	440.2	310.9	210.5	160.4
49	30960	3104	1557	628.3	451.4	318.9	215.8	164.4
50	31750	3183	1596	644.1	462.7	326.8	221.2	168.4

Table of n satisfying the equation B(c,n,p)= 0.999

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
0	0.004483	0.003477	0.002805	0.002322	0.001958	0.001673	0.001443
1	1.041	1.025	1.017	1.012	1.008	1.006	1.005
2	2.238	2.132	2.078	2.048	2.031	2.020	2.014
3	3.775	3.445	3.259	3.153	3.092	3.057	3.036
4	5.654	5.011	4.621	4.379	4.228	4.136	4.081
5	7.803	6.790	6.154	5.737	5.461	5.280	5.166
6	10.16	8.737	7.825	7.211	6.788	6.497	6.301
7	12.69	10.81	9.608	8.780	8.197	7.782	7.490
8	15.36	13.01	11.48	10.42	9.672	9.125	8.729
9	18.16	15.30	13.43	12.13	11.20	10.51	10.01
10	21.05	17.66	15.44	13.90	12.78	11.95	11.32
11	24.04	20.10	17.52	15.71	14.40	13.42	12.67
12	27.11	22.60	19.64	17.57	16.05	14.92	14.05
13	30.25	25.16	21.81	19.46	17.74	16.44	15.45
14	33.45	27.77	24.02	21.39	19.46	18.00	16.87
15	36.71	30.42	26.27	23.35	21.20	19.57	18.32
16	40.02	33.11	28.55	25.33	22.96	21.17	19.78
17	43.38	35.84	30.86	27.34	24.75	22.78	21.25
18	46.79	38.60	33.19	29.37	26.56	24.41	22.74
19	50.23	41.40	35.55	31.43	28.38	26.06	24.25
20	53.71	44.22	37.94	33.50	30.22	27.72	25.76
21	57.23	47.07	40.35	35.59	32.08	29.39	27.29
22	60.78	49.95	42.78	37.70	33.95	31.08	28.83
23	64.36	52.85	45.22	39.83	35.83	32.77	30.38
24	67.98	55.77	47.69	41.97	37.73	34.48	31.93
25	71.61	58.72	50.17	44.12	39.64	36.20	33.50
26	75.28	61.68	52.67	46.29	41.56	37.93	35.08
27	78.96	64.66	55.19	48.47	43.49	39.66	36.66
28	82.67	67.66	57.72	50.66	45.43	41.41	38.25
29	86.41	70.68	60.26	52.87	47.38	43.16	39.85
30	90.16	73.72	62.81	55.08	49.34	44.92	41.45
31	93.93	76.77	65.38	57.30	51.30	46.69	43.06
32	97.73	79.83	67.96	59.54	53.28	48.47	44.68
33	101.5	82.91	70.55	61.78	55.26	50.25	46.30
34	105.3	86.00	73.15	64.03	57.25	52.04	47.93
35	109.2	89.10	75.76	66.30	59.25	53.83	49.56
36	113.0	92.22	78.39	68.56	61.26	55.63	51.20
37	116.9	95.35	81.02	70.84	63.27	57.44	52.84
38	120.8	98.49	83.66	73.13	65.29	59.25	54.49
39	124.7	101.6	86.31	75.42	67.31	61.07	56.14
40	128.6	104.8	88.96	77.72	69.34	62.89	57.80
41	132.5	107.9	91.63	80.02	71.38	64.72	59.46
42	136.5	111.1	94.30	82.33	73.42	66.55	61.12
43	140.4	114.3	96.98	84.65	75.47	68.39	62.79
44	144.4	117.5	99.67	86.98	77.52	70.23	64.46
45	148.4	120.7	102.3	89.31	79.58	72.07	66.14
46	152.4	123.9	105.0	91.64	81.64	73.92	67.82
47	156.4	127.1	107.7	93.98	83.70	75.77	69.50
48	160.4	130.4	110.4	96.33	85.77	77.63	71.19
49	164.4	133.6	113.2	98.68	87.85	79.49	72.88
50	168.4	136.9	115.9	101.0	89.93	81.36	74.57

Table of n satisfying the equation B(c,n,p)= 0.999

100p

c	0.1	1.0	2.0	5.0	7.0	10.0	15.0	20.0
51	32530	3261	1635	659.9	474.1	334.8	226.5	172.5
52	33320	3340	1675	675.7	485.4	342.7	231.9	176.5
53	34110	3419	1714	691.6	496.8	350.7	237.2	180.6
54	34900	3499	1754	707.5	508.2	358.8	242.6	184.6
55	35690	3578	1794	723.5	519.6	366.8	248.0	188.7
56	36490	3658	1833	739.5	531.1	374.9	253.4	192.8
57	37280	3737	1873	755.5	542.6	382.9	258.8	196.9
58	38080	3817	1913	771.6	554.1	391.0	264.3	201.0
59	38880	3897	1954	787.7	565.6	399.1	269.7	205.1
60	39680	3978	1994	803.9	577.2	407.2	275.1	209.2
61	40490	4058	2034	820.0	588.8	415.4	280.6	213.3
62	41290	4139	2074	836.2	600.4	423.5	286.1	217.4
63	42100	4219	2115	852.4	612.0	431.7	291.5	221.6
64	42910	4300	2155	868.7	623.6	439.9	297.0	225.7
65	43720	4381	2196	885.0	635.3	448.0	302.5	229.9
66	44530	4462	2236	901.3	647.0	456.3	308.0	234.0
67	45340	4544	2277	917.6	658.7	464.5	313.5	238.2
68	46150	4625	2318	934.0	670.4	472.7	319.1	242.3
69	46970	4707	2359	950.4	682.1	480.9	324.6	246.5
70	47790	4789	2400	966.8	693.9	489.2	330.1	250.7
71	48600	4870	2441	983.3	705.6	497.5	335.7	254.9
72	49420	4952	2482	999.7	717.4	505.8	341.2	259.1
73	50240	5034	2523	1016	729.2	514.0	346.8	263.3
74	51060	5117	2564	1032	741.1	522.3	352.4	267.5
75	51890	5199	2605	1049	752.9	530.7	357.9	271.7
76	52710	5281	2646	1065	764.7	539.0	363.5	275.9
77	53530	5364	2688	1082	776.6	547.3	369.1	280.1
78	54360	5447	2729	1099	788.5	555.7	374.7	284.3
79	55190	5529	2770	1115	800.4	564.0	380.3	288.5
80	56020	5612	2812	1132	812.3	572.4	385.9	292.8
81	56840	5695	2854	1149	824.3	580.8	391.5	297.0
82	57670	5778	2895	1165	836.2	589.2	397.1	301.3
83	58510	5862	2937	1182	848.2	597.6	402.8	305.5
84	59340	5945	2978	1199	860.1	606.0	408.4	309.7
85	60170	6028	3020	1215	872.1	614.4	414.1	314.0
86	61010	6112	3062	1232	884.1	622.8	419.7	318.3
87	61840	6195	3104	1249	896.1	631.2	425.4	322.5
88	62680	6279	3146	1266	908.2	639.7	431.0	326.8
89	63510	6363	3188	1283	920.2	648.1	436.7	331.1
90	64350	6446	3230	1299	932.2	656.6	442.3	335.3
91	65190	6531	3272	1316	944.3	665.1	448.0	339.6
92	66030	6615	3314	1333	956.4	673.6	453.7	343.9
93	66870	6700	3356	1350	968.5	682.0	459.4	348.2
94	67710	6783	3398	1367	980.6	690.5	465.1	352.5
95	68550	6867	3440	1384	992.7	699.0	470.8	356.8
96	69400	6952	3482	1401	1004	707.5	476.5	361.1
97	70240	7036	3525	1418	1016	716.1	482.2	365.4
98	71080	7121	3567	1435	1029	724.6	487.9	369.7
99	71930	7205	3609	1452	1041	733.1	493.6	374.0
100	72780	7290	3652	1469	1053	741.7	499.3	378.3

Table of n satisfying the equation B(c,n,p)= 0.999

100p

c	20.0	25.0	30.0	35.0	40.0	45.0	50.0
51	172.5	140.1	118.6	103.4	92.01	83.22	76.26
52	176.5	143.4	121.4	105.7	94.10	85.09	77.96
53	180.6	146.7	124.1	108.1	96.19	86.97	79.66
54	184.6	149.9	126.9	110.5	98.29	88.85	81.37
55	188.7	153.2	129.6	112.8	100.3	90.73	83.07
56	192.8	156.5	132.4	115.2	102.4	92.61	84.78
57	196.9	159.8	135.2	117.6	104.5	94.50	86.49
58	201.0	163.1	137.9	120.0	106.7	96.39	88.21
59	205.1	166.4	140.7	122.4	108.8	98.28	89.92
60	209.2	169.7	143.5	124.8	110.9	100.1	91.64
61	213.3	173.0	146.3	127.2	113.0	102.0	93.37
62	217.4	176.4	149.0	129.6	115.1	103.9	95.09
63	221.6	179.7	151.8	132.0	117.2	105.8	96.81
64	225.7	183.0	154.6	134.4	119.4	107.7	98.54
65	229.9	186.4	157.4	136.9	121.5	109.6	100.2
66	234.0	189.7	160.2	139.3	123.6	111.5	102.0
67	238.2	193.1	163.1	141.7	125.8	113.5	103.7
68	242.3	196.4	165.9	144.1	127.9	115.4	105.4
69	246.5	199.8	168.7	146.6	130.1	117.3	107.2
70	250.7	203.1	171.5	149.0	132.2	119.2	108.9
71	254.9	206.5	174.3	151.4	134.3	121.1	110.6
72	259.1	209.9	177.2	153.9	136.5	123.1	112.4
73	263.3	213.2	180.0	156.3	138.6	125.0	114.1
74	267.5	216.6	182.8	158.8	140.8	126.9	115.9
75	271.7	220.0	185.7	161.2	143.0	128.8	117.6
76	275.9	223.4	188.5	163.7	145.1	130.8	119.4
77	280.1	226.8	191.4	166.1	147.3	132.7	121.1
78	284.3	230.2	194.2	168.6	149.4	134.6	122.9
79	288.5	233.6	197.0	171.0	151.6	136.6	124.6
80	292.8	237.0	199.9	173.5	153.8	138.5	126.4
81	297.0	240.4	202.8	176.0	155.9	140.5	128.2
82	301.3	243.8	205.6	178.4	158.1	142.4	129.9
83	305.5	247.2	208.5	180.9	160.3	144.3	131.7
84	309.7	250.6	211.3	183.4	162.5	146.3	133.4
85	314.0	254.1	214.2	185.8	164.6	148.2	135.2
86	318.3	257.5	217.1	188.3	166.8	150.2	137.0
87	322.5	260.9	220.0	190.8	169.0	152.1	138.7
88	326.8	264.4	222.8	193.3	171.2	154.1	140.5
89	331.1	267.8	225.7	195.7	173.4	156.0	142.3
90	335.3	271.2	228.6	198.2	175.5	158.0	144.0
91	339.6	274.7	231.5	200.7	177.7	159.9	145.8
92	343.9	278.1	234.4	203.2	179.9	161.9	147.6
93	348.2	281.6	237.2	205.7	182.1	163.9	149.4
94	352.5	285.0	240.1	208.2	184.3	165.8	151.1
95	356.8	288.5	243.0	210.7	186.5	167.8	152.9
96	361.1	291.9	245.9	213.2	188.7	169.7	154.7
97	365.4	295.4	248.8	215.7	190.9	171.7	156.5
98	369.7	298.8	251.7	218.2	193.1	173.7	158.2
99	374.0	302.3	254.6	220.7	195.3	175.6	160.0
100	378.3	305.8	257.5	223.2	197.5	177.6	161.8

Table of n satisfying the equation B(c,n,p) = P for c = 1

100p	P = 0.001	0.005	0.010	0.025	0.050	0.100	0.200	0.500
0.1	9230	7427	6636	5570	4742	3889	2994	1678
0.5	1843	1483	1325	1113	946.9	776.5	597.9	335.3
1.0	919.3	739.8	661.1	554.9	472.6	387.6	298.5	167.5
1.5	611.5	492.2	439.8	369.2	314.4	257.9	198.7	111.6
2.0	457.6	368.3	329.1	276.3	235.4	193.1	148.8	83.58
3.5	259.7	209.1	186.9	156.9	133.7	109.7	84.55	47.61
5.0	180.6	145.4	130.0	109.2	92.99	76.34	58.89	33.23
6.0	149.8	120.6	107.8	90.56	77.18	63.37	48.90	27.63
7.0	127.8	102.9	91.98	77.29	65.88	54.11	41.77	23.64
8.5	104.5	84.15	75.24	62.23	53.91	44.30	34.22	19.40
10.0	88.15	71.03	63.52	53.39	45.54	37.43	28.93	16.44
12.5	69.66	56.16	50.23	42.24	36.04	29.64	22.94	13.08
15.0	57.33	46.23	41.36	34.80	29.71	24.45	18.94	10.85
17.5	48.51	39.14	35.02	29.48	25.18	20.74	16.09	9.247
20.0	41.90	33.82	30.27	25.49	21.78	17.95	13.94	8.047
22.5	36.74	29.67	26.56	22.38	19.13	15.78	12.27	7.114
25.0	32.62	26.35	23.60	19.89	17.01	14.05	10.94	6.367
27.5	29.24	23.63	21.17	17.85	15.28	12.62	9.838	5.756
30.0	26.41	21.36	19.14	16.15	13.83	11.44	8.925	5.247
32.5	24.02	19.43	17.42	14.71	12.60	10.43	8.151	4.815
35.0	21.96	17.78	15.94	13.47	11.55	9.562	7.487	4.446
37.5	20.18	16.34	14.66	12.39	10.63	8.811	6.910	4.125
40.0	18.61	15.08	13.53	11.44	9.822	8.153	6.405	3.844
42.5	17.22	13.96	12.53	10.61	9.110	7.570	5.957	3.596
45.0	15.98	12.97	11.64	9.858	8.476	7.051	5.558	3.376
47.5	14.87	12.07	10.85	9.188	7.906	6.584	5.201	3.178
50.0	13.86	11.26	10.12	8.583	7.391	6.163	4.878	3.000

100p	P = 0.800	0.900	0.950	0.975	0.990	0.995	0.999
0.1	824.4	532.0	355.6	242.5	148.9	105.9	45.88
0.5	164.9	106.5	71.39	48.82	30.14	21.15	9.571
1.0	82.52	53.41	35.86	24.60	15.28	10.81	5.045
1.5	55.04	35.69	24.01	16.53	10.34	7.366	3.545
2.0	41.30	26.82	18.09	12.50	7.871	5.647	2.803
3.5	23.64	15.43	10.48	7.318	4.701	3.449	1.870
5.0	16.58	10.88	7.448	5.250	3.441	2.580	1.518
6.0	13.83	9.111	6.267	4.448	2.954	2.248	1.389
7.0	11.87	7.848	5.425	3.877	2.610	2.013	1.302
8.5	9.797	6.511	4.535	3.275	2.248	1.771	1.217
10.0	8.344	5.576	3.913	2.856	2.000	1.605	1.162
12.5	6.699	4.519	3.213	2.386	1.724	1.426	1.106
15.0	5.603	3.816	2.749	2.078	1.547	1.314	1.074
17.5	4.822	3.317	2.421	1.861	1.426	1.239	1.054
20.0	4.237	2.944	2.177	1.703	1.339	1.187	1.041
22.5	3.783	2.655	1.990	1.582	1.274	1.149	1.032
25.0	3.420	2.426	1.843	1.488	1.225	1.121	1.025
27.5	3.124	2.240	1.724	1.414	1.188	1.099	1.021
30.0	2.879	2.086	1.627	1.353	1.158	1.083	1.017
32.5	2.671	1.957	1.546	1.304	1.134	1.069	1.014
35.0	2.494	1.847	1.478	1.263	1.114	1.059	1.012
37.5	2.342	1.753	1.421	1.229	1.098	1.050	1.010
40.0	2.209	1.672	1.371	1.200	1.085	1.043	1.008
42.5	2.092	1.602	1.329	1.176	1.074	1.038	1.007
45.0	1.989	1.540	1.292	1.155	1.065	1.033	1.006
47.5	1.897	1.485	1.260	1.137	1.057	1.029	1.005
50.0	1.815	1.437	1.232	1.121	1.050	1.025	1.005

Table of n satisfying the equation B(c,n,p) = P for c = 2

P

100p	0.001	0.005	0.010	0.025	0.050	0.100	0.200	0.500
0.1	11230	9271	8403	7223	6294	5321	4278	2674
0.5	2242	1852	1678	1443	1258	1063	854.7	534.5
1.0	1119	923.8	837.4	719.9	627.5	530.6	426.8	267.1
1.5	744.0	614.7	557.2	479.1	417.6	353.2	284.2	177.9
2.0	556.9	460.1	417.1	358.7	312.7	264.5	212.9	133.4
3.5	316.2	261.4	237.0	203.8	177.8	150.4	121.2	76.06
5.0	220.0	181.9	164.9	141.9	123.8	104.8	84.44	53.14
6.0	182.5	150.9	136.9	117.8	102.8	87.03	70.17	44.23
7.0	155.8	128.8	116.9	100.6	87.77	74.36	59.98	37.86
8.5	127.5	105.5	95.64	82.35	71.89	60.93	49.19	31.12
10.0	107.6	89.04	80.80	69.59	60.77	51.54	41.64	26.40
12.5	85.11	70.47	63.97	55.13	48.17	40.88	33.07	21.05
15.0	70.12	58.09	52.75	45.48	39.77	33.78	27.36	17.49
17.5	59.40	49.24	44.72	38.59	33.76	28.70	23.28	14.94
20.0	51.35	42.59	38.70	33.41	29.25	24.89	20.22	13.03
22.5	45.09	37.42	34.01	29.38	25.74	21.92	17.83	11.54
25.0	40.07	33.28	30.26	26.16	22.93	19.55	15.93	10.35
27.5	35.96	29.88	27.18	23.51	20.63	17.60	14.36	9.382
30.0	32.53	27.05	24.62	21.31	18.70	15.98	13.06	8.571
32.5	29.62	24.65	22.44	19.44	17.08	14.60	11.96	7.885
35.0	27.12	22.58	20.57	17.83	15.68	13.42	11.01	7.297
37.5	24.95	20.79	18.95	16.44	14.46	12.40	10.18	6.787
40.0	23.04	19.22	17.52	15.21	13.40	11.50	9.459	6.340
42.5	21.36	17.83	16.26	14.13	12.46	10.70	8.822	5.946
45.0	19.85	16.59	15.14	13.17	11.62	9.990	8.254	5.595
47.5	18.50	15.47	14.13	12.30	10.86	9.354	7.744	5.282
50.0	17.28	14.47	13.22	11.52	10.18	8.779	7.285	5.000

P

100p	0.800	0.900	0.950	0.975	0.990	0.995	0.999
0.1	1535	1102	818.2	619.3	436.8	338.6	191.4
0.5	307.2	220.8	164.1	124.4	87.99	68.40	39.02
1.0	153.7	110.6	82.36	62.56	44.39	34.62	19.97
1.5	102.5	73.92	55.11	41.94	29.86	23.37	13.63
2.0	76.98	55.55	41.48	31.63	22.60	17.74	10.46
3.5	44.09	31.94	23.96	18.38	13.26	10.52	6.413
5.0	30.94	22.50	16.96	13.09	9.544	7.641	4.808
6.0	25.82	18.83	14.24	11.03	8.099	6.526	4.192
7.0	22.17	16.21	12.30	9.570	7.070	5.733	3.758
8.5	18.30	13.44	10.24	8.019	5.983	4.898	3.306
10.0	15.60	11.50	8.812	6.937	5.227	4.319	2.999
12.5	12.53	9.304	7.189	5.716	4.378	3.672	2.668
15.0	10.49	7.843	6.110	4.907	3.820	3.251	2.462
17.5	9.037	6.802	5.344	4.335	3.428	2.959	2.328
20.0	7.946	6.024	4.773	3.910	3.141	2.748	2.238
22.5	7.098	5.421	4.332	3.584	2.923	2.591	2.176
25.0	6.421	4.941	3.982	3.327	2.754	2.472	2.132
27.5	5.869	4.550	3.698	3.120	2.621	2.379	2.100
30.0	5.410	4.226	3.465	2.952	2.514	2.307	2.078
32.5	5.022	3.953	3.270	2.812	2.428	2.250	2.061
35.0	4.691	3.722	3.105	2.696	2.357	2.205	2.048
37.5	4.405	3.523	2.965	2.598	2.300	2.169	2.038
40.0	4.156	3.350	2.844	2.515	2.252	2.140	2.031
42.5	3.937	3.200	2.740	2.444	2.213	2.116	2.025
45.0	3.744	3.067	2.649	2.384	2.180	2.097	2.020
47.5	3.571	2.951	2.570	2.332	2.153	2.081	2.017
50.0	3.417	2.847	2.501	2.287	2.130	2.068	2.014

Table of n satisfying the equation B(c,n,p) = P for c = 3

	P							
100p	0.001	0.005	0.010	0.025	0.050	0.100	0.200	0.500
0.1	13060	10980	10050	8765	7752	6579	5514	3672
0.5	2608	2192	2006	1751	1549	1335	1102	734.1
1.0	1302	1094	1001	873.9	773.0	666.3	550.3	366.9
1.5	865.8	727.9	666.2	581.6	514.6	443.6	366.5	244.5
2.0	648.1	544.9	498.8	435.5	385.3	332.2	274.5	183.3
3.5	368.2	309.7	283.5	247.6	219.2	189.1	156.4	104.6
5.0	256.2	215.6	197.4	172.5	152.7	131.8	109.1	73.10
6.0	212.7	179.0	163.9	143.3	126.9	109.5	90.65	60.86
7.0	181.6	152.8	140.0	122.4	108.4	93.58	77.52	52.12
8.5	148.6	125.1	114.6	100.3	88.81	76.73	63.61	42.86
10.0	125.5	105.8	96.87	84.74	75.12	64.94	53.87	36.38
12.5	99.35	83.74	76.76	67.19	59.60	51.57	42.84	29.04
15.0	81.91	69.08	63.34	55.48	49.25	42.65	35.48	24.14
17.5	69.44	58.60	53.76	47.12	41.85	36.28	30.22	20.65
20.0	60.08	50.74	46.56	40.84	36.30	31.49	26.27	18.02
22.5	52.80	44.62	40.96	35.95	31.98	27.77	23.20	15.98
25.0	46.96	39.72	36.48	32.04	28.52	24.79	20.74	14.35
27.5	42.18	35.70	32.80	28.83	25.68	22.35	18.73	13.01
30.0	38.19	32.35	29.73	26.16	23.32	20.31	17.05	11.90
32.5	34.81	29.51	27.14	23.89	21.31	18.59	15.63	10.96
35.0	31.90	27.07	24.90	21.94	19.59	17.11	14.41	10.15
37.5	29.38	24.95	22.97	20.25	18.10	15.82	13.35	9.451
40.0	27.16	23.09	21.26	18.77	16.79	14.69	12.42	8.838
42.5	25.20	21.44	19.76	17.46	15.63	13.70	11.60	8.298
45.0	23.46	19.98	18.42	16.29	14.60	12.81	10.87	7.817
47.5	21.89	18.66	17.21	15.24	13.67	12.01	10.22	7.387
50.0	20.47	17.47	16.13	14.29	12.83	11.29	9.621	7.000

	P						
100p	0.800	0.900	0.950	0.975	0.990	0.995	0.999
0.1	2297	1745	1367	1090	824.3	673.3	429.8
0.5	459.7	349.5	274.0	218.9	165.7	135.3	87.00
1.0	230.0	175.1	137.4	109.9	83.42	68.39	44.15
1.5	153.4	116.9	91.91	73.62	55.98	45.99	29.87
2.0	115.1	87.87	69.14	55.46	42.26	34.79	22.74
3.5	65.98	50.49	39.87	32.11	24.63	20.40	13.58
5.0	46.29	35.54	28.16	22.78	17.59	14.65	9.936
6.0	38.64	29.72	23.61	19.15	14.85	12.42	8.524
7.0	33.17	25.57	20.36	16.56	12.90	10.83	7.520
8.5	27.39	21.18	16.93	13.83	10.84	9.160	6.465
10.0	23.34	18.11	14.52	11.91	9.406	7.991	5.734
12.5	18.75	14.63	11.80	9.755	7.783	6.674	4.921
15.0	15.69	12.31	10.00	8.319	6.709	5.807	4.395
17.5	13.51	10.66	8.714	7.299	5.949	5.197	4.033
20.0	11.88	9.426	7.752	6.539	5.386	4.747	3.775
22.5	10.61	8.468	7.008	5.953	4.954	4.405	3.586
25.0	9.597	7.703	6.416	5.488	4.615	4.139	3.445
27.5	8.769	7.080	5.935	5.112	4.343	3.928	3.339
30.0	8.080	6.563	5.537	4.803	4.122	3.759	3.259
32.5	7.498	6.127	5.203	4.545	3.939	3.622	3.199
35.0	7.001	5.756	4.920	4.328	3.788	3.510	3.153
37.5	6.572	5.437	4.678	4.143	3.662	3.418	3.119
40.0	6.197	5.160	4.469	3.986	3.556	3.343	3.092
42.5	5.868	4.917	4.287	3.850	3.467	3.282	3.072
45.0	5.576	4.703	4.128	3.733	3.392	3.231	3.057
47.5	5.316	4.514	3.988	3.631	3.329	3.190	3.045
50.0	5.084	4.345	3.866	3.543	3.275	3.156	3.036

Table of np satisfying the equation B(c,np) = P

c	P = 0.200	0.100	0.050	0.025	0.010	0.005	0.001
0	1.609	2.303	2.996	3.689	4.605	5.298	6.908
1	2.994	3.890	4.744	5.572	6.638	7.430	9.233
2	4.279	5.322	6.296	7.225	8.406	9.274	11.23
3	5.515	6.681	7.754	8.767	10.05	10.98	13.06
4	6.721	7.994	9.154	10.24	11.60	12.59	14.79
5	7.906	9.275	10.51	11.67	13.11	14.15	16.45
6	9.075	10.53	11.84	13.06	14.57	15.66	18.06
7	10.23	11.77	13.15	14.42	16.00	17.13	19.63
8	11.38	12.99	14.43	15.76	17.40	18.58	21.16
9	12.52	14.21	15.71	17.08	18.78	20.00	22.66
10	13.65	15.41	16.96	18.39	20.14	21.40	24.13
11	14.78	16.60	18.21	19.68	21.49	22.78	25.59
12	15.90	17.78	19.44	20.96	22.82	24.14	27.03
13	17.01	18.96	20.67	22.23	24.14	25.50	28.45
14	18.13	20.13	21.89	23.49	25.45	26.84	29.85
15	19.23	21.29	23.10	24.74	26.74	28.16	31.24
16	20.34	22.45	24.30	25.98	28.03	29.48	32.62
17	21.44	23.61	25.50	27.22	29.31	30.79	33.99
18	22.54	24.76	26.69	28.45	30.58	32.09	35.35
19	23.63	25.90	27.88	29.67	31.85	33.38	36.70
20	24.73	27.05	29.06	30.89	33.10	34.67	38.04
21	25.82	28.18	30.24	32.10	34.35	35.95	39.37
22	26.91	29.32	31.41	33.31	35.60	37.22	40.70
23	28.00	30.45	32.59	34.51	36.84	38.48	42.02
24	29.08	31.58	33.75	35.71	38.08	39.74	43.33
25	30.17	32.71	34.92	36.90	39.31	41.00	44.64
26	31.25	33.84	36.08	38.10	40.53	42.25	45.94
27	32.33	34.96	37.23	39.28	41.76	43.50	47.23
28	33.41	36.08	38.39	40.47	42.98	44.74	48.52
29	34.49	37.20	39.54	41.65	44.19	45.98	49.80
30	35.56	38.32	40.69	42.83	45.40	47.21	51.08
31	36.64	39.43	41.84	44.00	46.61	48.44	52.36
32	37.71	40.54	42.98	45.17	47.81	49.67	53.63
33	38.79	41.65	44.13	46.34	49.01	50.89	54.90
34	39.86	42.76	45.27	47.51	50.21	52.11	56.16
35	40.93	43.87	46.40	48.68	51.41	53.32	57.42
36	42.00	44.98	47.54	49.84	52.60	54.54	58.67
37	43.07	46.08	48.68	51.00	53.79	55.75	59.93
38	44.14	47.19	49.81	52.16	54.98	56.96	61.17
39	45.20	48.29	50.94	53.31	56.16	58.16	62.42
40	46.27	49.39	52.07	54.47	57.35	59.36	63.66
41	47.33	50.49	53.20	55.62	58.53	60.56	64.90
42	48.40	51.59	54.32	56.77	59.71	61.76	66.14
43	49.46	52.69	55.45	57.92	60.88	62.96	67.37
44	50.53	53.78	56.57	59.07	62.06	64.15	68.60
45	51.59	54.88	57.70	60.21	63.23	65.34	69.83
46	52.65	55.97	58.82	61.36	64.40	66.53	71.06
47	53.71	57.07	59.94	62.50	65.57	67.72	72.28
48	54.77	58.16	61.05	63.64	66.74	68.90	73.51
49	55.83	59.25	62.17	64.78	67.90	70.08	74.72
50	56.89	60.34	63.29	65.92	69.07	71.27	75.94

Tables of np satisfying the equation B(c,np) = P

c	P = 0.800	0.900	0.950	0.975	0.990	0.995	0.999
0	0.2231	0.1054	0.05129	0.02532	0.01005	0.005013	0.001001
1	0.8244	0.5318	0.3554	0.2422	0.1486	0.1035	0.04540
2	1.535	1.102	0.8177	0.6187	0.4360	0.3379	0.1905
3	2.297	1.745	1.366	1.090	0.8232	0.6722	0.4286
4	3.090	2.433	1.970	1.623	1.279	1.078	0.7394
5	3.904	3.152	2.613	2.202	1.785	1.537	1.107
6	4.734	3.895	3.285	2.814	2.330	2.037	1.520
7	5.576	4.656	3.981	3.454	2.906	2.571	1.971
8	6.428	5.432	4.695	4.115	3.507	3.132	2.452
9	7.289	6.221	5.425	4.795	4.130	3.717	2.961
10	8.157	7.021	6.169	5.491	4.771	4.321	3.491
11	9.031	7.829	6.924	6.201	5.428	4.943	4.042
12	9.910	8.646	7.690	6.922	6.099	5.580	4.611
13	10.79	9.470	8.464	7.654	6.782	6.231	5.195
14	11.68	10.30	9.246	8.395	7.477	6.893	5.794
15	12.57	11.14	10.04	9.145	8.181	7.567	6.405
16	13.47	11.98	10.83	9.903	8.895	8.251	7.028
17	14.37	12.82	11.63	10.67	9.616	8.943	7.662
18	15.27	13.67	12.44	11.44	10.35	9.644	8.306
19	16.17	14.53	13.25	12.22	11.08	10.35	8.958
20	17.08	15.38	14.07	13.00	11.83	11.07	9.619
21	17.99	16.24	14.89	13.79	12.57	11.79	10.29
22	18.90	17.11	15.72	14.58	13.33	12.52	10.96
23	19.81	17.97	16.55	15.38	14.09	13.26	11.65
24	20.72	18.84	17.38	16.18	14.85	14.00	12.34
25	21.64	19.72	18.22	16.98	15.62	14.74	13.03
26	22.56	20.59	19.06	17.79	16.40	15.49	13.73
27	23.48	21.47	19.90	18.61	17.17	16.25	14.44
28	24.40	22.35	20.75	19.42	17.96	17.00	15.15
29	25.32	23.23	21.59	20.24	18.74	17.77	15.87
30	26.24	24.11	22.44	21.06	19.53	18.53	16.59
31	27.17	25.00	23.30	21.89	20.32	19.30	17.32
32	28.09	25.89	24.15	22.72	21.12	20.08	18.05
33	29.02	26.77	25.01	23.55	21.92	20.86	18.78
34	29.95	27.66	25.87	24.38	22.72	21.64	19.52
35	30.88	28.56	26.73	25.21	23.53	22.42	20.26
36	31.81	29.45	27.59	26.05	24.33	23.21	21.00
37	32.74	30.34	28.46	26.89	25.14	24.00	21.75
38	33.67	31.24	29.33	27.73	25.96	24.79	22.51
39	34.60	32.14	30.20	28.58	26.77	25.59	23.26
40	35.54	33.04	31.07	29.42	27.59	26.38	24.02
41	36.47	33.94	31.94	30.27	28.41	27.18	24.78
42	37.41	34.84	32.81	31.12	29.23	27.99	25.54
43	38.34	35.74	33.69	31.97	30.05	28.79	26.31
44	39.28	36.65	34.56	32.82	30.88	29.60	27.08
45	40.22	37.55	35.44	33.68	31.70	30.41	27.85
46	41.15	38.46	36.32	34.53	32.53	31.22	28.62
47	42.09	39.36	37.20	35.39	33.36	32.03	29.40
48	43.03	40.27	38.08	36.25	34.20	32.85	30.18
49	43.97	41.18	38.96	37.11	35.03	33.66	30.96
50	44.91	42.09	39.85	37.97	35.87	34.48	31.74

Tables of np satisfying the equation $B(c,np) = P$

c	P = 0.200	0.100	0.050	0.025	0.010	0.005	0.001
51	57.95	61.43	64.40	67.06	70.23	72.45	77.16
52	59.01	62.52	65.52	68.19	71.39	73.62	78.37
53	60.07	63.61	66.63	69.33	72.55	74.80	79.58
54	61.12	64.69	67.74	70.46	73.71	75.97	80.79
55	62.18	65.78	68.85	71.59	74.86	77.15	82.00
56	63.24	66.86	69.96	72.72	76.02	78.32	83.20
57	64.29	67.95	71.07	73.85	77.17	79.49	84.41
58	65.35	69.03	72.18	74.98	78.32	80.66	85.61
59	66.40	70.12	73.28	76.11	79.48	81.82	86.81
60	67.46	71.20	74.39	77.23	80.62	82.99	88.01
61	68.51	72.28	75.49	78.36	81.77	84.15	89.20
62	69.56	73.36	76.60	79.48	82.92	85.32	90.40
63	70.62	74.44	77.70	80.60	84.07	86.48	91.59
64	71.67	75.52	78.80	81.73	85.21	87.64	92.79
65	72.72	76.60	79.91	82.85	86.36	88.80	93.98
66	73.77	77.68	81.01	83.97	87.50	89.96	95.17
67	74.83	78.76	82.11	85.09	88.64	91.11	96.35
68	75.88	79.84	83.21	86.21	89.78	92.27	97.54
69	76.93	80.91	84.31	87.32	90.92	93.42	98.73
70	77.98	81.99	85.40	88.44	92.06	94.58	99.91
71	79.03	83.07	86.50	89.56	93.20	95.73	101.1
72	80.08	84.14	87.60	90.67	94.33	96.88	102.3
73	81.13	85.22	88.69	91.79	95.47	98.03	103.5
74	82.17	86.29	89.79	92.90	96.60	99.18	104.6
75	83.22	87.36	90.89	94.01	97.74	100.3	105.8
76	84.27	88.44	91.98	95.13	98.87	101.5	107.0
77	85.32	89.51	93.07	96.24	100.0	102.6	108.2
78	86.37	90.58	94.17	97.35	101.1	103.8	109.3
79	87.41	91.65	95.26	98.46	102.3	104.9	110.5
80	88.46	92.73	96.35	99.57	103.4	106.1	111.7
81	89.51	93.80	97.44	100.7	104.5	107.2	112.9
82	90.55	94.87	98.53	101.8	105.7	108.3	114.0
83	91.60	95.94	99.62	102.9	106.8	109.5	115.2
84	92.65	97.01	100.7	104.0	107.9	110.6	116.4
85	93.69	98.08	101.8	105.1	109.0	111.8	117.5
86	94.74	99.15	102.9	106.2	110.2	112.9	118.7
87	95.78	100.2	104.0	107.3	111.3	114.0	119.9
88	96.83	101.3	105.1	108.4	112.4	115.2	121.0
89	97.87	102.4	106.2	109.5	113.5	116.3	122.2
90	98.92	103.4	107.2	110.6	114.7	117.4	123.3
91	99.96	104.5	108.3	111.7	115.8	118.6	124.5
92	101.0	105.6	109.4	112.8	116.9	119.7	125.7
93	102.0	106.6	110.5	113.9	118.0	120.8	126.8
94	103.1	107.7	111.6	115.0	119.1	122.0	128.0
95	104.1	108.8	112.7	116.1	120.3	123.1	129.1
96	105.2	109.8	113.7	117.2	121.4	124.2	130.3
97	106.2	110.9	114.8	118.3	122.5	125.4	131.5
98	107.3	111.9	115.9	119.4	123.6	126.5	132.6
99	108.3	113.0	117.0	120.5	124.7	127.6	133.8
100	109.3	114.1	118.1	121.6	125.8	128.8	134.9

c	P = 0.800	0.900	0.950	0.975	0.990	0.995	0.999
51	45.85	43.00	40.73	38.84	36.71	35.30	32.53
52	46.80	43.91	41.62	39.70	37.55	36.13	33.31
53	47.74	44.82	42.51	40.57	38.39	36.95	34.10
54	48.68	45.74	43.40	41.43	39.23	37.78	34.89
55	49.62	46.65	44.29	42.30	40.07	38.60	35.69
56	50.57	47.56	45.18	43.17	40.92	39.43	36.48
57	51.51	48.48	46.07	44.04	41.76	40.26	37.28
58	52.46	49.40	46.96	44.91	42.61	41.09	38.08
59	53.40	50.31	47.85	45.79	43.46	41.93	38.88
60	54.35	51.23	48.75	46.66	44.31	42.76	39.68
61	55.29	52.15	49.64	47.54	45.16	43.60	40.48
62	56.24	53.07	50.54	48.41	46.02	44.43	41.29
63	57.19	53.99	51.43	49.29	46.87	45.27	42.09
64	58.14	54.91	52.33	50.17	47.73	46.11	42.90
65	59.08	55.83	53.23	51.04	48.58	46.95	43.71
66	60.03	56.75	54.13	51.92	49.44	47.79	44.52
67	60.98	57.67	55.03	52.80	50.30	48.64	45.33
68	61.93	58.59	55.93	53.69	51.16	49.48	46.15
69	62.88	59.51	56.83	54.57	52.02	50.33	46.96
70	63.83	60.44	57.73	55.45	52.88	51.17	47.78
71	64.78	61.36	58.63	56.34	53.74	52.02	48.60
72	65.73	62.29	59.54	57.22	54.60	52.87	49.42
73	66.68	63.21	60.44	58.11	55.47	53.72	50.24
74	67.63	64.14	61.35	58.99	56.33	54.57	51.06
75	68.58	65.06	62.25	59.88	57.20	55.42	51.88
76	69.53	65.99	63.16	60.77	58.07	56.28	52.70
77	70.49	66.92	64.06	61.66	58.93	57.13	53.53
78	71.44	67.84	64.97	62.55	59.80	57.98	54.35
79	72.39	68.77	65.88	63.44	60.67	58.84	55.18
80	73.34	69.70	66.79	64.33	61.54	59.70	56.01
81	74.30	70.63	67.70	65.22	62.41	60.55	56.84
82	75.25	71.56	68.60	66.11	63.29	61.41	57.67
83	76.21	72.49	69.51	67.00	64.16	62.27	58.50
84	77.16	73.42	70.42	67.89	65.03	63.13	59.33
85	78.11	74.35	71.34	68.79	65.91	63.99	60.16
86	79.07	75.28	72.25	69.68	66.78	64.85	61.00
87	80.02	76.21	73.16	70.58	67.66	65.72	61.83
88	80.98	77.14	74.07	71.47	68.53	66.58	62.67
89	81.93	78.08	74.98	72.37	69.41	67.44	63.51
90	82.89	79.01	75.90	73.27	70.29	68.31	64.34
91	83.85	79.94	76.81	74.16	71.17	69.17	65.18
92	84.80	80.88	77.73	75.06	72.05	70.04	66.02
93	85.76	81.81	78.64	75.96	72.92	70.91	66.86
94	86.71	82.74	79.56	76.86	73.81	71.77	67.70
95	87.67	83.68	80.47	77.76	74.69	72.64	68.55
96	88.63	84.61	81.39	78.66	75.57	73.51	69.39
97	89.59	85.55	82.30	79.56	76.45	74.38	70.23
98	90.54	86.48	83.22	80.46	77.33	75.25	71.08
99	91.50	87.42	84.14	81.36	78.22	76.12	71.92
100	92.46	88.35	85.06	82.27	79.10	76.99	72.77